TANDY®

Service Manual

26-3212

CM-2

COLOR MONITOR

Catalog Number : 26-3212

CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

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I. SPECIFICATIONS

Description	Nominal	Limit
1. Power input	AC 120V, 60Hz	
2. AC input current	0.65A	+10% −30%
3. Input signal		
a) RGB Video	RGB separate T.T.L. Level, positive white (default)	2.4 – 5.0Vp-p
b) Synchronous	T.T.L. level, positive going (default)	
c) Intensity	T.T.L. level, positive going (default)	
4. Resolution		
a) Horizontal	640 dots	
b) Vertical (non interplaced)	225 lines	
6. Brightness		30 fl. min. (at intensity white)
8. Display color	15 colors	
9. High voltage	23 kV/0μA	27.5 kV max./0μA
10. Picture linearity		
a) Horizontal		10% max.
b) Vertical		10% max.
11. Synchronous (Pull in range)		
a) Horizontal	15.701 kHz	+300 −400 Hz
b) Vertical	60 Hz	+0 −11 Hz

NOTE:
Nominal specs represent the design specs; all units should be able to approxmiate these – some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any limit spec.

IMPORTANT SERVICE SAFETY PRECAUTIONS

- Service work should be performed only by qualified service technicians who are thoroughly familiar with all of the following safety checks and servicing guidelines:

WARNING

1. For continued safety, do not attempt to modify circuit.
2. Disconnect the AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10K ohm-resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (AC line cord should be disconnected from AC outlet).

1. The picture tube in this display monitor employs integral implosion protection.
2. Replace with a tube of the same type number for continued safety.
3. Do not lift the picture tube by the neck.
4. Handle the picture tube only when wearing shatter-proof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in a current solid-state display monitor is the picture tube. However, the picture tube does not emit measurable X-ray radiation if the high voltage is as specified in the "high-voltage check" instructions.
   It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube, including the lead in glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter. The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value — no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and, also, under certain conditions, may produce radiation in excess of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When troubleshooting and taking test measurements on a display monitor with excessive high voltage, avoid being unnecessarily close to the display monitor. Do not operate the display monitor longer than is necessary to locate the cause of excessive voltage.

BEFORE RETURNING THE DISPLAY MONITOR

Fire and Shock Hazard

Before returning the display monitor to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the display monitor.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner:

- Plug the AC line cord directly into an 120-volt AC outlet. (Do not use an isolation transformer for this test.)
- Using two clip leads, connect a 1.5Kohm, 10-watt resistor paralleled by a 0.15μF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
- Use a VTVM or VOM with 1000 ohm-per-volt or higher sensitivity to measure the AC voltage drop across the resistor. (See Figure 1.)

IMPORTANT SERVICE SAFETY PRECAUTIONS (Cont'd)

- Connect the resistor connection to all exposed metal parts having a return path to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

All checks must be repeated with the AC line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these checks.)

Any reading of 0.3 volt RMS (this corresponds to 0.2 milliamp. AC.) or more is excessive and indicates a potential shock hazard which must be corrected before returning the display monitor to the user.

SAFETY NOTICE

Many electrical and mechanical parts in display monitors have special safety-related characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc.

Replacement parts that have these special safety characteristics are identified in this manual; electrical components having such features are identified by a ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagram. For continued protection, replacement parts must be identical to those used in the original circuit. The use of a substitute replacement part that does not have the same safety characteristics as specified in this service manual, may create shock, fire, X-radiation or other hazards.

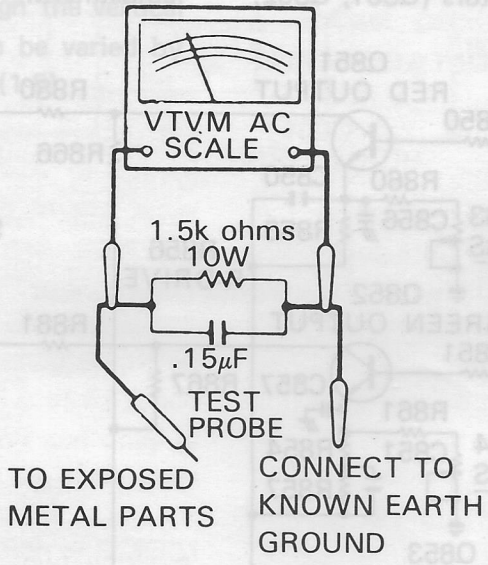


Figure 1. Leakage Current Test Circuit

II. THEORY OF OPERATION

2.1 RGB Drive Circuit

The RGB input signal with positive polarity is applied to the exclusive OR anode I491 and output by I492 in the negative polarity. The signal is inverted to the positive polarity and applied to the base of RGB-Amp transistors Q451, Q461 and Q471.

The bias of RGB-Amp transistors is adjustable by the BRIGHTNESS control (R420) and SUB-BRIGHTNESS VR (R419) connected to the base of Q401 and Q402.

When the intensity signal is of negative polarity, the transistor Q421 is turned to ON and the contrast can be adjusted by the CONTRAST control (R422).

2.2 Video (RGB) Output (Fig. 2)

An RGB drive system is utilized in the video output circuit of this unit. The function of this circuit is to combine the color signals and the brightness signal, and amplify them sufficiently to drive the cathodes. 145V DC must be applied to the collectors of the output transistors (Q851, Q852, Q853). When the horizontal output circuit is operating, pulses are developed and fed to the 110V supply where they are applied to a winding of the horizontal output transformer (T602). This pulsed DC voltage is then taken from terminal ④ of T602 and applied through D603, and R866 or R867 or R868 to the collectors of Q851, Q852 and Q853, respectively.

The brightness signal from the Blanking (Q402) is applied to the emitters of Q851, Q852 and Q853. C850, C851 and C852 are peaking capacitors.

Computer signals from the outputs of Q451, Q461, Q471 are applied to the bases of Q851, Q852 and Q853. The picture tube used in this unit is a precision, inline gun-type and, therefore, the control grid (G1) and the screen grid (G2) are common with respect to the red, green and blue cathodes. Consequently, the emitter circuits of Q851, Q852 and Q853 are provided with bias controls (R863, R864 and R865, respectively) for picture tube cut-off adjustment. Drive controls (R856 and R858) are provided in the emitter circuits of Q851 and Q853 for white balance adjustment.

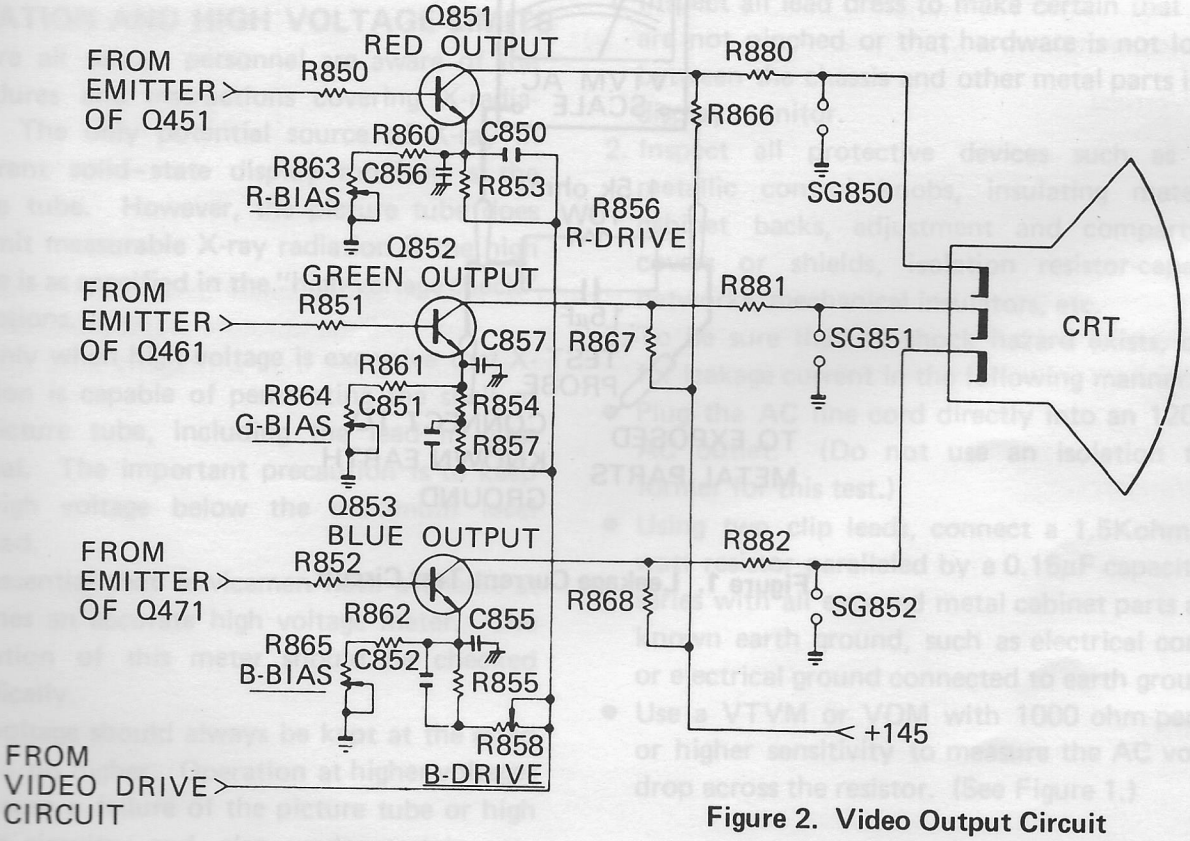


Figure 2. Video Output Circuit

2.3 Vertical Deflection Circuit

The vertical sync. signal with positive polarity is applied to pin ⑦ of the vertical and horizontal IC (I601) through I481.

Pin ⑧ of I601 is connected to the vertical oscillator circuit. The frequency of the oscillator can be controlled by the voltage of pin ⑧ which can be varied by V.HOLD VR (R514).

The saw-tooth signal is obtained by the integrating circuit which is connected between pin ⑤ and pin ⑧.

The oscillator output is fed to the vertical drive circuit through a buffer circuit and its output, derived from pin ②, is applied to the vertical output.

The saw-tooth wave is applied to pin ③ of I601 as an AC feed-back.

The emitter circuit of Q501 is controlled by V-SIZE VR (R507) to vary the vertical size of the raster.

Adjust linearity by intergrating the saw-tooth voltage.

V. LIN. VR (R526) is used for vertical linearity adjustment.

Vertical position is determined by the amount of DC component flowing through the vertical deflection coil. The amount can be varied by changing the position of V-CENT (1-5).

2.4 Horizontal Oscillator, AFC and Drive Circuit

The horizontal sync. signal with positive polarity is applied to pin ⑭ of I601.

The saw-tooth wave of the horizontal frequency is produced by integrating the horizontal pulse from FBT (T602), and is fed to pin ⑬ of I601 for the AFC. The phase of horizontal sawtooth wave is compared with that of horizontal sync. signal from pin ⑭ at AFC circuit inside the I601.

H. CENT control (R619) determines the relative position of the raster and picture.

The horizontal oscillation frequency can be controlled by H. HOLD VR R607 connected to pin ⑫.

The horizontal frequency is obtained from pin ⑩ of I601, and is fed to the next horizontal drive circuit. The pulse switching mode of the driver and output stage is a reverse polarity type; that is, when the driver transistor is ON, the output transistor is OFF.

2.5 Horizontal Output and HV Rectifier (Figs. 3—5)

Horizontal drive voltage, developed at pin ⑩ of the deflection processor integrated circuit (I601), is amplified through the horizontal drive stage (Q601) and coupled to the base of the horizontal output circuit via the horizontal drive transformer (T601). Refer to Fig. 3.

The horizontal output circuit generates the horizontal scan and high voltage to be applied to the picture tube. The function of the horizontal output stage (Q602) is to serve as a switch for the horizontal output circuit. During the horizontal scanning period, Q operates (S1 is closed, S2 is open) and the current is applied in one direction through the horizontal coils of the deflection yoke (LY) and the capacitor (C). During retrace time, Q is inoperative (S1 is open, S2 is closed) and the current is applied in the opposite direction through the damper diode (D), the horizontal coils of the deflection yoke (LY) and the capacitor (C). Refer to Fig. 4. The high voltage required to be applied to the anode of the picture tube is generated by boosting the pulse from the collector of Q602 through T602 during the flyback (retrace) period and applying this boosted pulse to a series of silicon rectifiers. (Refer to Figure 5)

High voltage regulation is accomplished internally in T602.

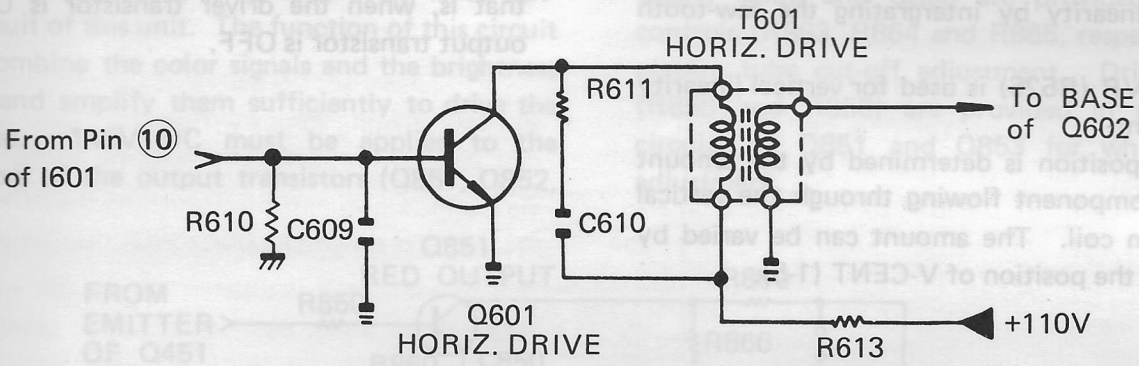


Figure 3. Horizontal Drive Circuit

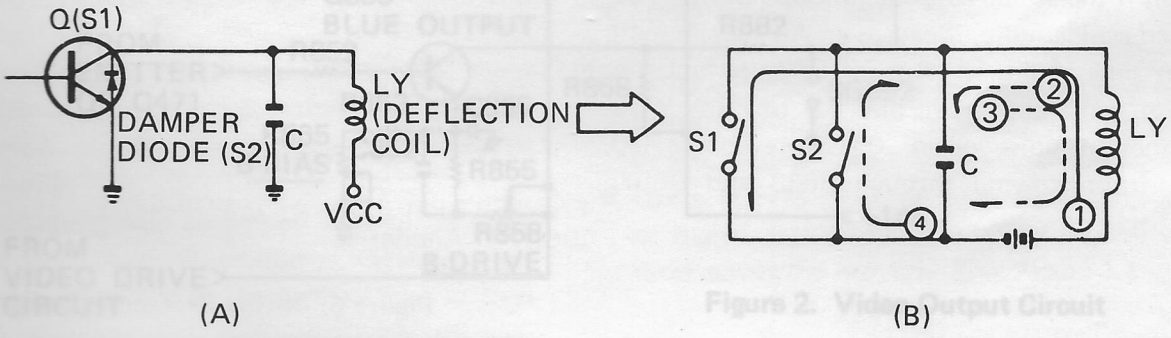


Figure 4. Equivalent Circuit of Horizontal Output Circuit

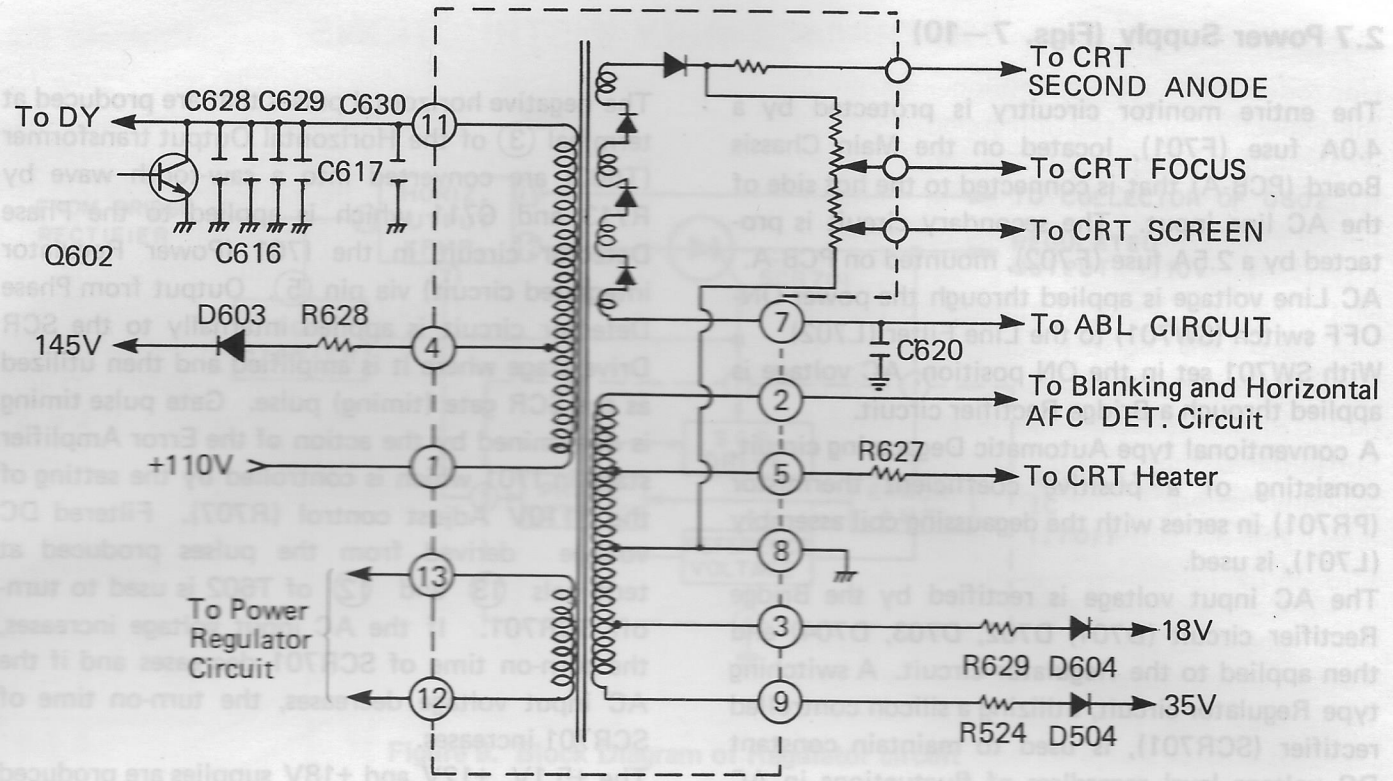


Figure 5. Horizontal Output and HV Rectifier Circuit

2.6 X-ray Protector Circuit

The X-ray protector circuit is made up of an 18-volt line detector circuit and an extinction pulse detector circuit. If the B+110-volt line increases accidentally, it will cause the 18-volt line to increase. If the 18-volt line becomes higher than zener voltage of ZD601 (18V zener diode), the current flows through ZD601, R620 to pin ⑨ of I601. This turns on the SCR in the X-ray protector circuit (inside I601) and stops the horizontal oscillation circuit.

In normal operation, where there is no short-circuit between the anode and cathode of SCR701, an extinction pulse is applied to pin ⑫ of FBT, and entering C615, it is rectified by D607 and C627 to turn on Q603. With Q603 turned on, there is no current flowing in pin ⑨ of I601.

However, if the anode-cathode junction of SCR701 is shorted accidentally, it causes an AC short-circuit between pins ⑫ and ⑬ of FBT, so that no extinction pulse appears at pin ⑫ of FBT. With no extinction pulse given; C615 prevents a DC current from flowing through R633 and D607, thereby turning Q603 off. As a result, the 12V line causes the current to flow to pin ⑨ of I601 via R634, D606 and R620 turning the SCR in I601 on shutting down the horizontal oscillation circuit in I601.

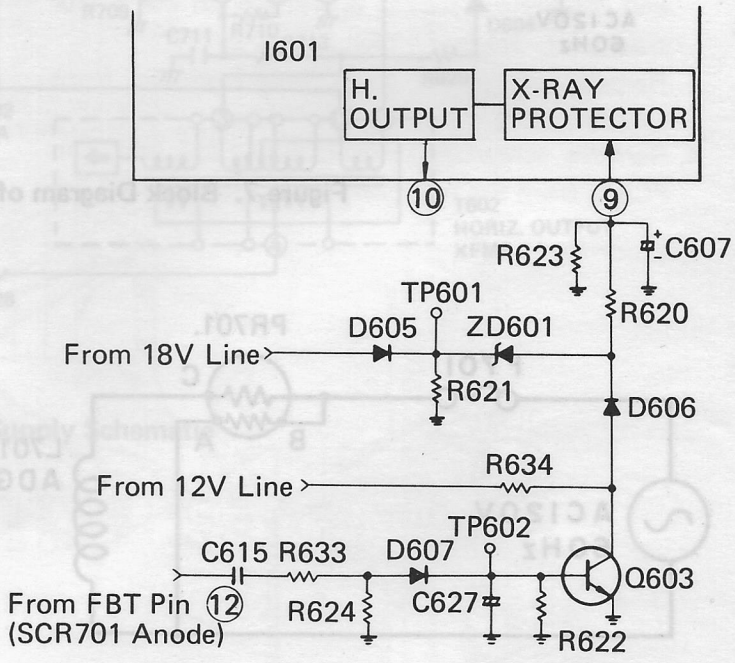


Figure 6. X-Ray Protector Circuit

2.7 Power Supply (Figs. 7—10)

The entire monitor circuitry is protected by a 4.0A fuse (F701), located on the Main Chassis Board (PCB-A) that is connected to the hot side of the AC line input. The secondary circuit is protected by a 2.5A fuse (F702), mounted on PCB-A.

AC Line voltage is applied through the power ON-OFF switch (SW701) to the Line Filter (L702).

With SW701 set in the ON position, AC voltage is applied through a Bridge Rectifier circuit.

A conventional type Automatic Degaussing circuit, consisting of a positive coefficient thermistor (PR701) in series with the degaussing coil assembly (L701), is used.

The AC input voltage is rectified by the Bridge Rectifier circuit (D701, D702, D703, D704) and then applied to the Regulator circuit. A switching type Regulator circuit, utilizing a silicon controlled rectifier (SCR701), is used to maintain constant DC voltage level regardless of fluctuations in AC input voltage.

The negative horizontal pulses that are produced at terminal ③ of the Horizontal Output transformer (T602) are converted into a saw-tooth wave by R713 and C711 which is applied to the Phase Detector circuit in the I701 (Power Regulator integrated circuit) via pin ⑤. Output from Phase Detector circuit is applied internally to the SCR Drive stage where it is amplified and then utilized as the SCR gate (timing) pulse. Gate pulse timing is determined by the action of the Error Amplifier stage in I701 which is controlled by the setting of the +110V Adjust control (R707). Filtered DC voltage derived from the pulses produced at terminals ⑬ and ⑫ of T602 is used to turn-off SCR701. If the AC input voltage increases, the turn-on time of SCR701 decreases and if the AC input voltage decreases, the turn-on time of SCR701 increases.

The +5.1V, +12V and +18V supplies are produced as a result of rectification through D604 of the pulses developed at terminal ③ of T602.

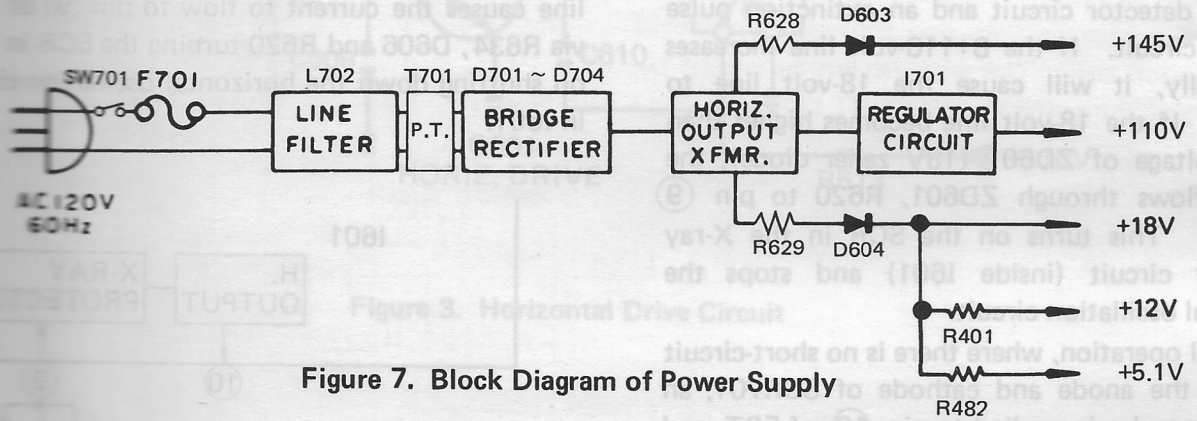


Figure 7. Block Diagram of Power Supply

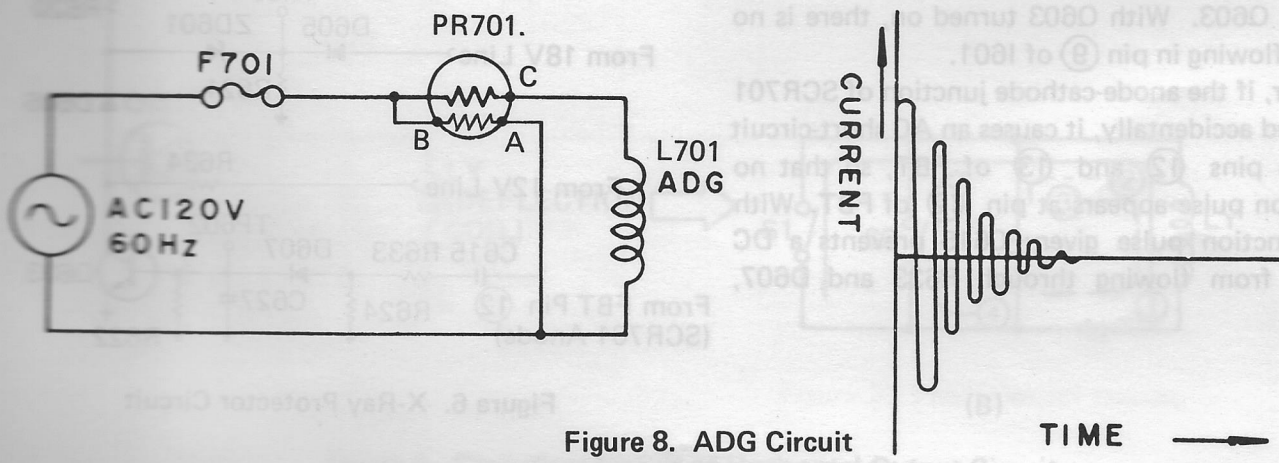


Figure 8. ADG Circuit

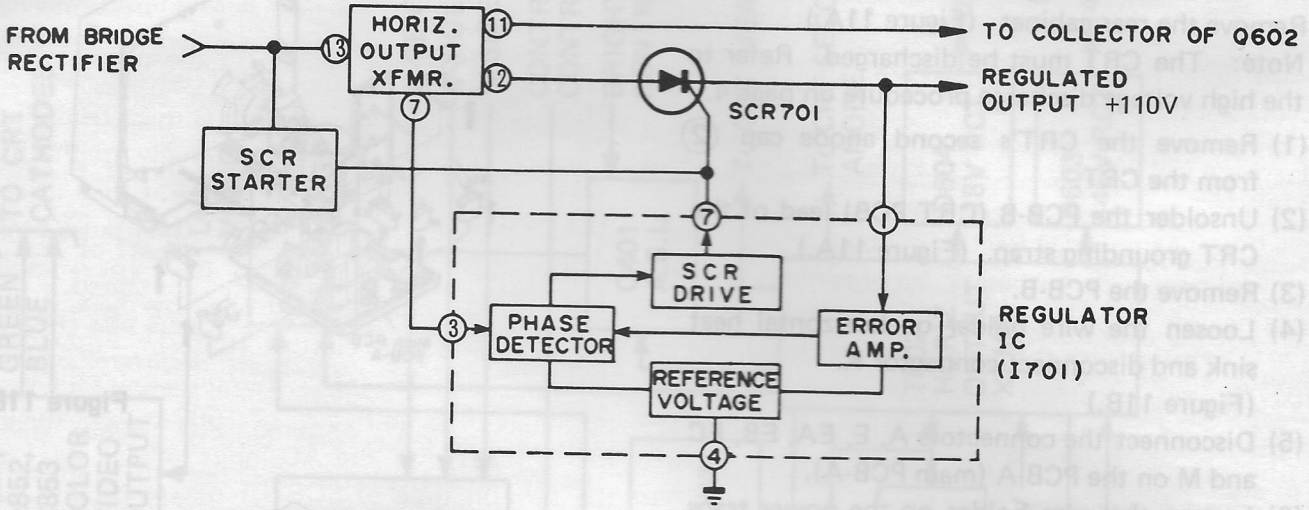


Figure 9. Block Diagram of Regulator circuit

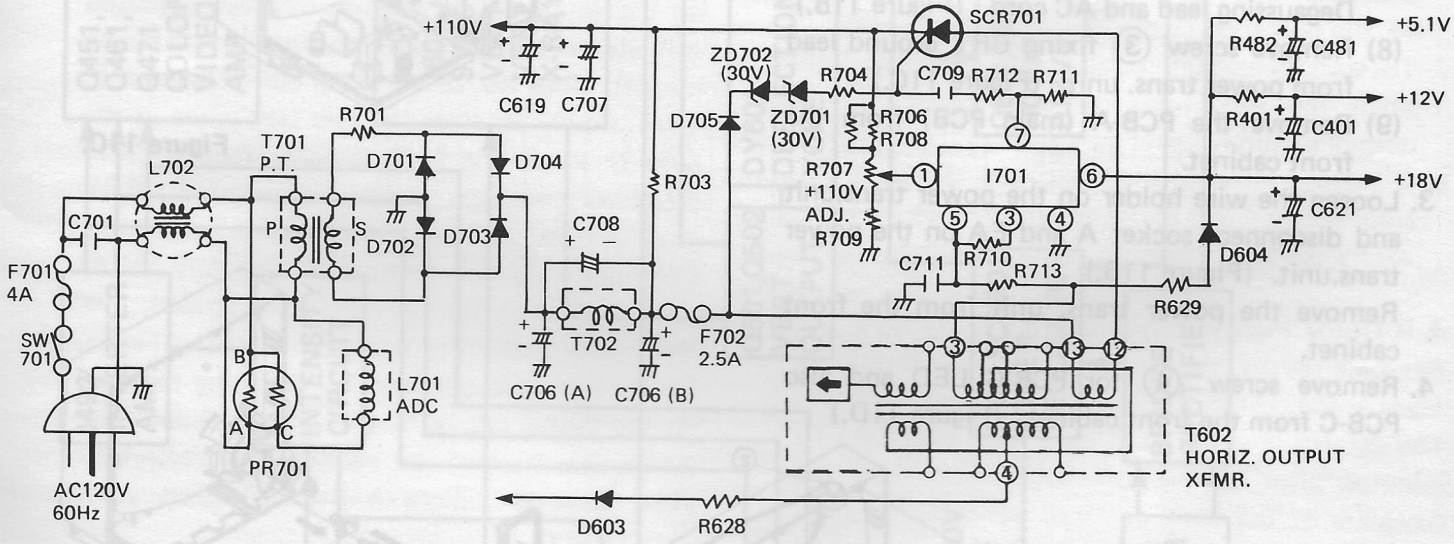


Figure 10. Power Supply Schematic

III. DISASSEMBLY INSTRUCTIONS

1. Remove six screws (1) retaining the rear cabinet. Remove the rear cabinet. (Figure 11A.)
   Note: The CRT must be discharged. Refer to the high voltage discharge procedure on page 4.
2. (1) Remove the CRT's second anode cap (2) from the CRT.
   (2) Unsolder the PCB-B (CRT PCB) lead of the CRT grounding strap. (Figure 11A.)
   (3) Remove the PCB-B.
   (4) Loosen the wire holder on horizontal heat sink and disconnect connector K. (Figure 11B.)
   (5) Disconnect the connectors A, E, EA, EB, EC and M on the PCB-A (main PCB-A).
   (6) Loosen the wire holder on the power trans. unit and disconnect the connectors M, R.G.B output lead, and service tip lead on the power trans.unit. (Figure 11B.)
   (7) Loosen the wire holder fixing power switch lead, CRT ground lead, RGB output lead, Degaussing lead and AC cord. (Figure 11B.)
   (8) Remove screw (3) fixing CRT ground lead from power trans. unit. (Figure 11C.)
   (9) Remove the PCB-A (main PCB) from the front cabinet.
3. Loosen the wire holder on the power trans.unit and disconnect socket A and EA on the power trans.unit. (Figure 11B.)
   Remove the power trans. unit from the front cabinet.
4. Remove screw (4) for PCB-C LED and also PCB-C from the front cabinet. (Figure 11D.)

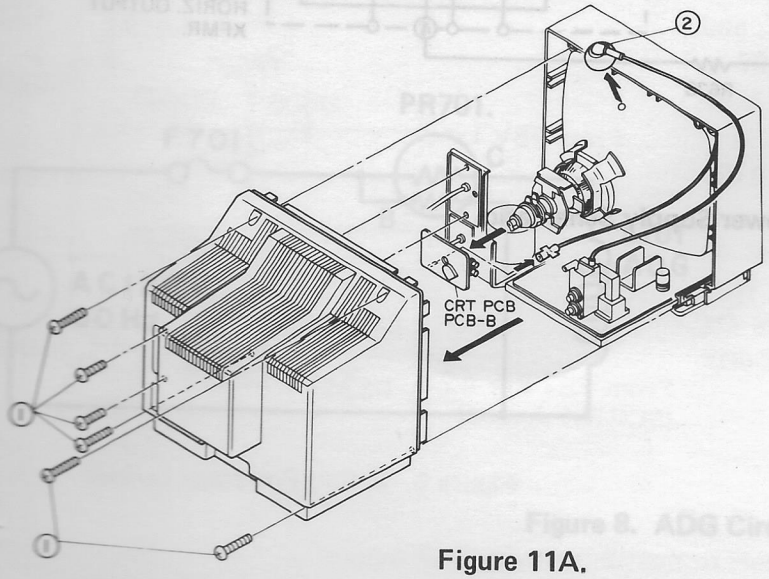


Figure 11A.

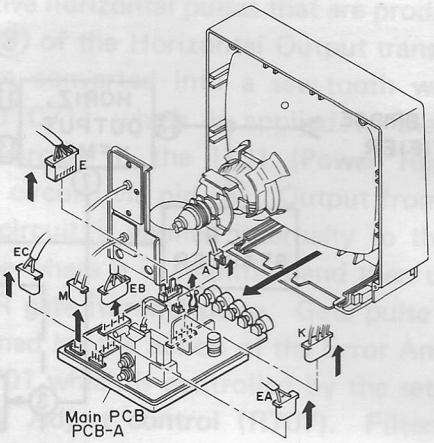


Figure 11B.

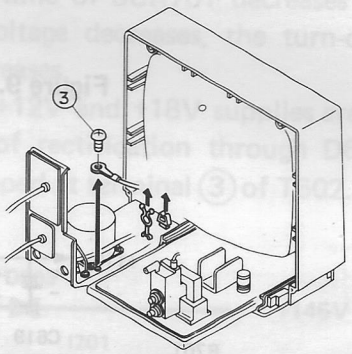


Figure 11C.

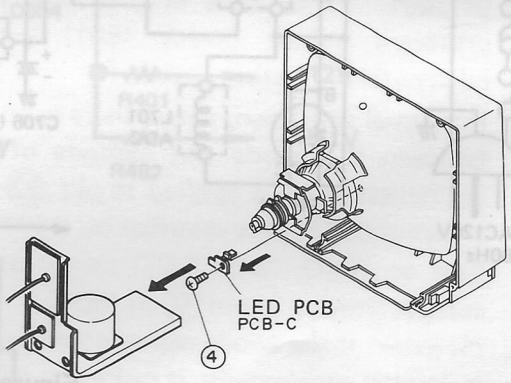
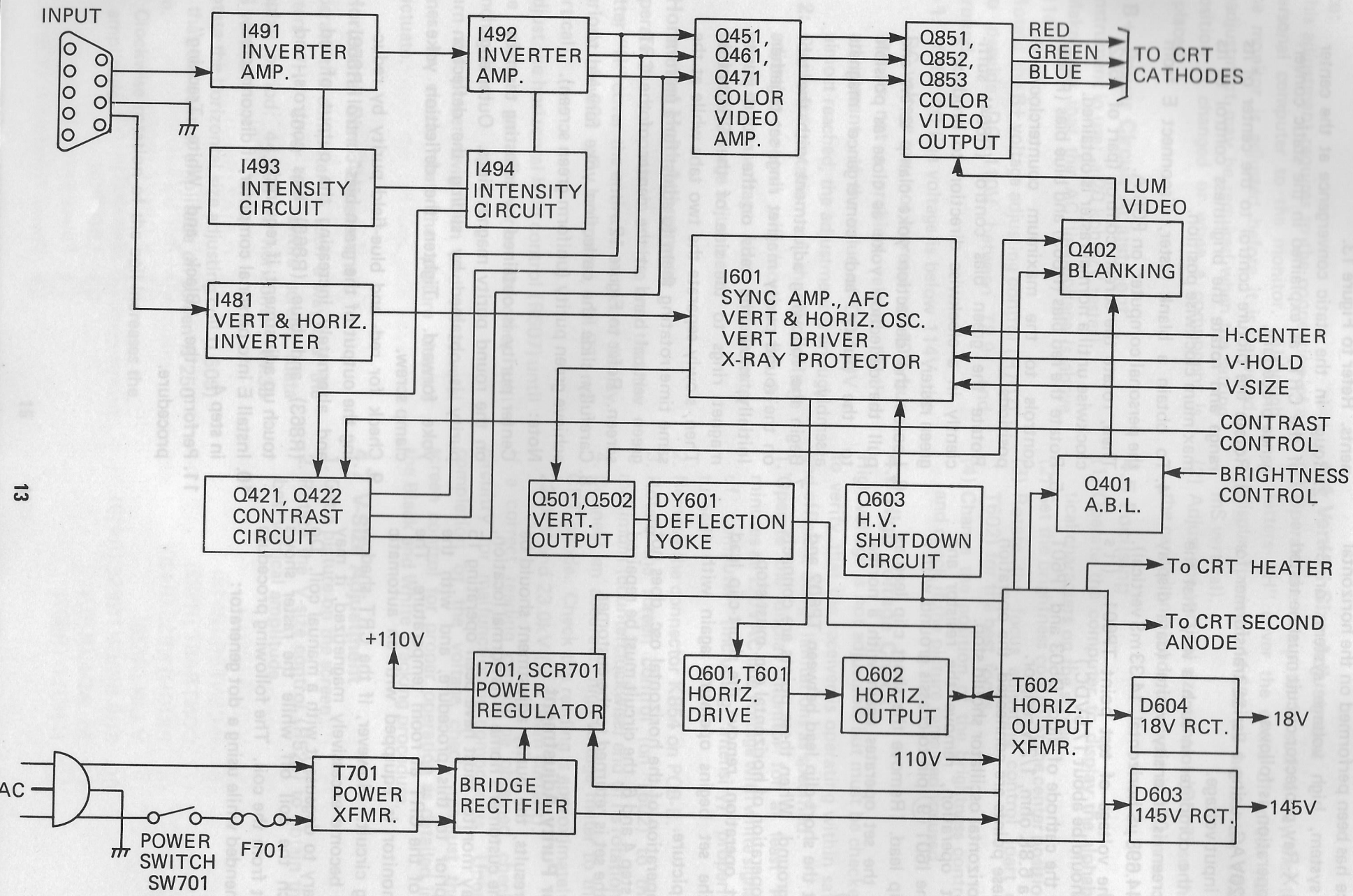
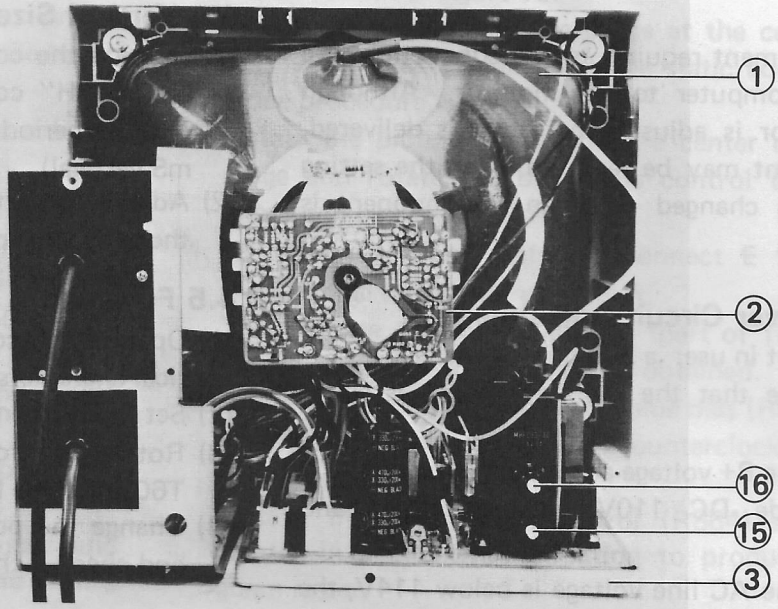


Figure 11D.

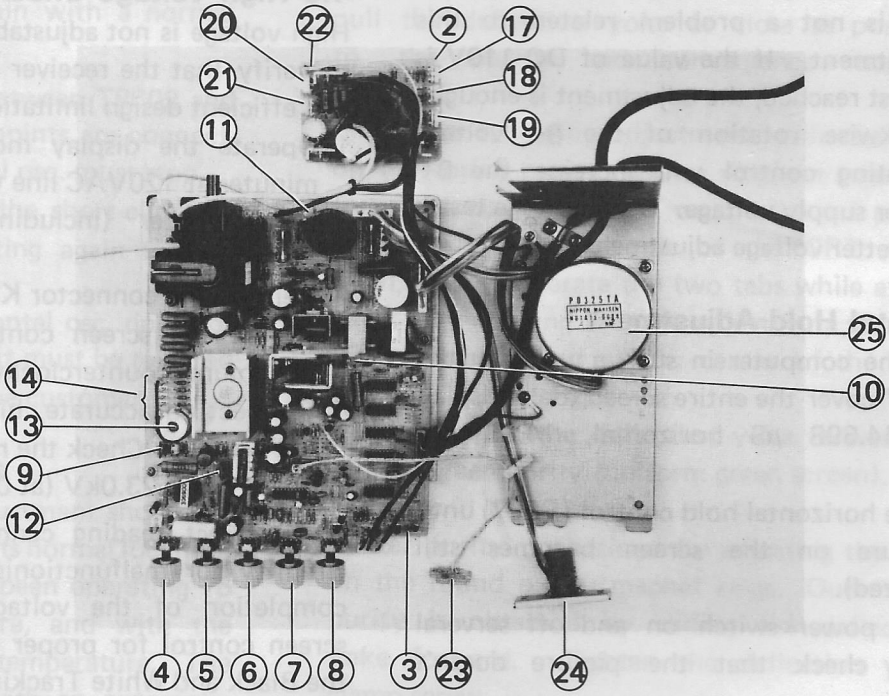

INPUT
I491 INVERTER AMP.
I492 INVERTER AMP.
Q451, Q461, Q471 COLOR VIDEO AMP.
Q851, Q852, Q853 COLOR VIDEO OUTPUT
RED
GREEN
BLUE
TO CRT CATHODES
I493 INTENSITY CIRCUIT
I494 INTENSITY CIRCUIT
LUM VIDEO
Q402 BLANKING
I481 VERT & HORIZ. INVERTER
I601 SYNC AMP., AFC VERT & HORIZ. OSC. VERT DRIVER X-RAY PROTECTOR
H-CENTER
V-HOLD
V-SIZE
CONTRAST CONTROL
BRIGHTNESS CONTROL
Q421, Q422 CONTRAST CIRCUIT
Q501,Q502 VERT. OUTPUT
DY601 DEFLECTION YOKE
Q603 H.V. SHUTDOWN CIRCUIT
Q401 A.B.L.
To CRT HEATER
To CRT SECOND ANODE
+110V
I701, SCR701 POWER REGULATOR
Q601,T601 HORIZ. DRIVE
Q602 HORIZ. OUTPUT
T602 HORIZ. OUTPUT XFMR.
D604 18V RCT.
18V
110V
AC
T701 POWER XFMR.
BRIDGE RECTIFIER
D603 145V RCT.
145V
POWER SWITCH SW701
F701

3.2 Parts Location

Rear View



Chassis Top View



1. Picture Tube
2. CRT Socket PCB
3. MAIN PCB
4. V-HOLD (R514)
5. V-SIZE (R507)
6. H-CENTER (R619)
7. CONTRAST (R422)
8. BRIGHTNESS (R420)
9. V-LIN (R526)
10. SUB-BRIGHTNESS (R419)
11. B+ ADJ. (R707)
12. H-HOLD (R607)
13. H-SIZE (L603)
14. V-CENTER (NO. 1 ~ NO. 5)
15. SCREEN Control
16. FOCUS Control
17. B-BIAS (R865)
18. G-BIAS (R864)
19. R-BIAS (R863)
20. R-DRIVE (R856)
21. B-DRIVE (R858)
22. Service Tip (K854)
23. LED PCB
24. Power Switch (SW701)
25. Power Transformer (T701)

IV. ALIGNMENT INSTRUCTIONS

Note:

This adjustment requires to the connection of a personal computer to the monitor. Although the monitor is adjusted before it is delivered, readjustment may be required when the setting position is changed or when a component is replaced.

4.1 B+ Power Circuit Adjustment

(Instrument in use: a 20 kohm/V tester)

(1) Make sure that the AC line voltage is above 114V.

(2) Rotate the B+ voltage adjusting control (R707) to provide DC 110V between TP 91 and ground.

Note 1: If the AC line voltage is below 114V, the DC voltage may not increase to 110V, but this is not a problem related to this adjustment. If the value of DC 110V is almost reached, the adjustment is enough.

Note 2: Clockwise rotation of the B+ voltage adjusting control will increase the B+ power supply voltage. Use a voltage tester for better voltage adjustment.

4.2 Horizontal Hold Adjustment

(1) Operate the computer in such a way that the letter "H" cover the entire screen (data display period: 44.698 μS horizontal, 14.33 mS vertical).

(2) Adjust the horizontal hold control (R607) until the picture on the screen becomes still (synchronized).

(3) Turn the power switch on and off serveral times to check that the picture doesn't fluctuate.

4.3 Horizontal Size Adjustment

(1) Operate the computer in such a way that the letters "H" cover the entire screen (data display period: 44.698 μS horizontal, 14.33 mS vertical).

(2) Rotate the horizontal size adjusting coil (L603) so that the central amplitude on screen is 250 mm.

Note: Clockwise rotation of the coil increases the amplitude.

4.4 Vertical Size Adjustment

(1) Operate the computer in such a way that the letters "H" cover the entire of screen (data display period: 44.698 μS horizontal, 14.33 mS vertical).

(2) Adjust the vertical size control (R507) so that the central amplitude on screen is 190 mm.

4.5 Focusing

(1) Operate the computer to display the alphabetical characters on the screen.

(2) Set the brightness control at the center position.

(3) Rotate the focus adjusting control (part of T602) for the best focus.

(4) Change the position of the brightness control and check if the picture remained focused.

4.6 High Voltage Check

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified.

1. Operate the display monitor for at least 15 minutes at 120VAC line voltage with white signal of computer (including intensity) properly turned.
2. Remove the connector K854 on PCB-B.
3. Rotate the screen control (on T602) to the maximum (counterclockwise) end of its rotation.
4. Connect an accurate, high-voltage meter to the CRT anode. Check the reading is approximately 22.0kV and 23.0kV (at 0 beam current).

If a correct reading cannot be obtained, check circuitry for malfunctioning components. Upon completion of the voltage check, readjust the screen control for proper operation as detailed in the Black and White Tracking procedure.

4.7 V-Size Adjustment

1. Get a picture on the screen.
2. Rotate the V-size control (R526) to obtain the best vertical amplitude.

4.8 X-ray Protector Circuit Test

After service has been performed on the horizontal deflection system, high voltage system, or B+ system, the X-Ray protector circuit must be tested for proper operation as follows:

1. Apply 120VAC, using a variac transformer for accurate input voltage.
2. Operate the computer in such a way that the entire screen is intensity white (data display period: 44.698 μS horizontal, 14.33 mS vertical).
3. Check the voltage of test point TP601. (It's voltage should be about 17.5VDC.)
4. Connect the cathode of diode D503 and TP601 through a 6.8K ohm, 1/2W resistor.
   When these points are connected, the operation of the horizontal oscillator should stop.
5. To start operation, remove the resistor and touch the I601 (9) pin-to-chassis ground with a short clip lead. (Remove the short clip lead as soon as the set operates again with a normal picture.)
6. Connect the short-clip lead between TP602 and chassis ground. When these points are connected, the operation of horizontal osc. must stop.
7. To start operation, remove the short-clip lead when the set begins operating again with a normal picture.
8. If the operation of the horizontal osc. does not stop in step 4 and 6, the circuit must be repaired before the set is returned to the customer.

4.9 Color Purity Adjustment

For best results, the purity adjustment should be made in the customer's home in its normal location. The display monitor must have been operating 15 minutes prior to this procedure, and with the faceplate of the CRT at room temperature. The display monitor is equipped with an automatic degaussing circuit. However, if the CRT shadow mask has become excessively magnetized, it may be necessary to degauss it with a manual coil. Do not switch the coil off while the raster shows any effect from the coil. The following procedure is recommended while using a dot generator:

1. Check for correct location of all neck components. Refer to Figure 13.
2. Rough in the static convergence at the center of the CRT, as explained in the static convergence procedure.
3. Rotate the picture control to the center of its range and rotate the brightness control to its maximum clockwise position.
4. To obtain a blank raster, disconnect E from the personal computer, on PCB-A.
   Then, rotate the screen control (part of T602) clockwise until a normal raster is obtained.
5. Rotate the red bias (R863) and blue bias (R865) controls to the maximum counterclockwise positions.
   Rotate the green bias control (R864) sufficiently in a clockwise direction to produce a green raster.
6. Loosen the deflection yoke clamp screw and pull the deflection yoke as close as possible to the purity and convergence magnets assembly.
7. Begin the following adjustment with the tabs on the round purity magnet rings set together. Initially, move the tabs on the round purity magnet rings to the side of the CRT neck. Then, slowly separate the two tabs while at the same time rotating them to adjust for a uniform green vertical band at the center of the CRT screen. Refer to Figure 12.
8. Carefully slide the deflection yoke forward to achieve green purity (uniform green screen).
   Note:
   Center purity is obtained by adjusting the tabs on the round purity magnet rings. Outer edge purity is obtained by sliding the deflection yoke forward. Tighten the deflection yoke clamp screw.
9. Check for red- and blue-field purity by reducing the output of the green bias control (R859) and alternately increasing the output of red (R863) and blue (R865) bias controls, and touch up adjustment, if required.
10. Install E into personal computer, if disconnected in step 4.
11. Perform the "Black and White Tracking" procedure.

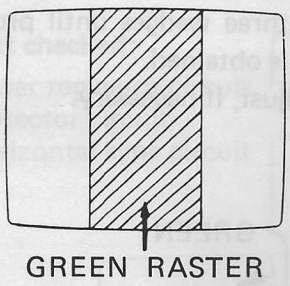


Figure 12. Color Purity Adjustment (Green Raster)

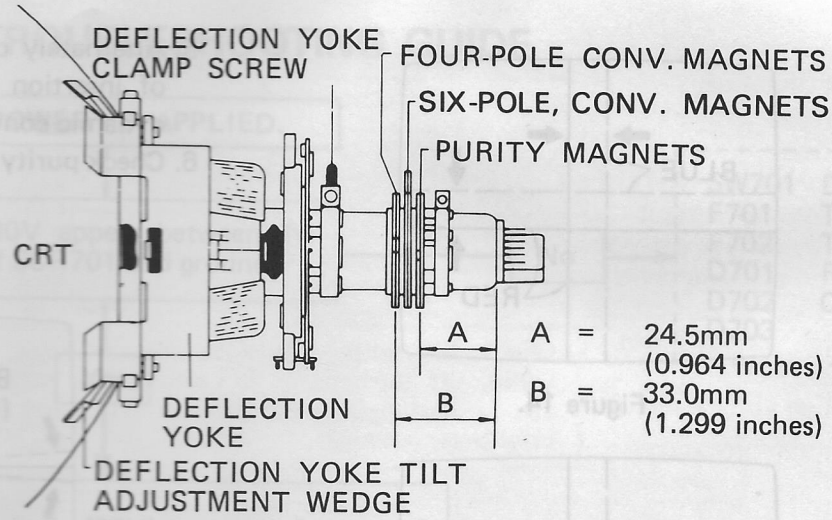


Figure 13. Picture Tube Neck Components Location

4.10 Black and White Tracking

1. Turn the screen control fully clockwise. Turn the red, green and blue bias controls fully clockwise. Set the brightness control and the red and blue drive controls at the center positions.
2. Operate the computer in such a way that the entire screen is intensity white (display period: 44.698 μS horizontal, 14.33 mS vertical).
3. Remove the service tip (V1).
4. Rotate the screen control counterclocwise until a raster (either the red, green or blue) appears dimly on screen.
5. Rotate two of the three bias controls counterclockwise until the raster becomes whitish: these two rotated controls must be the ones should control the colors other that the raster's colors.
6. Return the service tip (V1) to its original place.
7. Operate the computer in such a way that the entire screen remains intensity white.
   (display period: 44.698 μS horizontal, 14.33 mS vertical).
8. Rotate the red and blue drive controls until the raster is white.
9. Set the brightness control at its maximum position and adjust the screen control until there appears 4.2V DC between TP-402 and TP-403 (at both ends of R407).
   (Normal white pattern which does not include intensity.)
10. Turn the brightness control in either direction to check that the picture maintains a good white balance.
11. Repeat steps 3 thru 11 for readjustment.

4.11 Static (Center) Convergence (Figs. 13—15)

1. Switch the display monitor ON and allow it to warm up 15 minutes.
2. Operate the computer in such a way that the entire screen is a dot/bar pattern (display period: 44.698 μS horizontal, 14.33 mS vertical) on the center of the CRT screen.
   Proceed as follows:
   a. Locate the pair of four-pole magnet rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue lines. Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines. Refer to Figure 14.
   b. After completing red and blue center convergence, locate the pair of six-pole magnet rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue (magenta) and green lines. Rotate the pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue (magenta) and green lines. Refer to Figure 15.

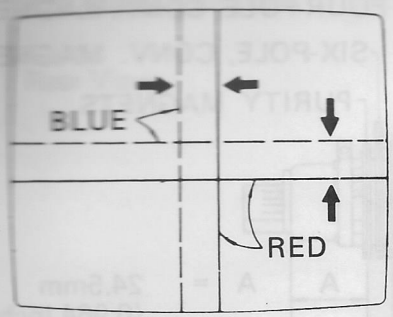


Figure 14.

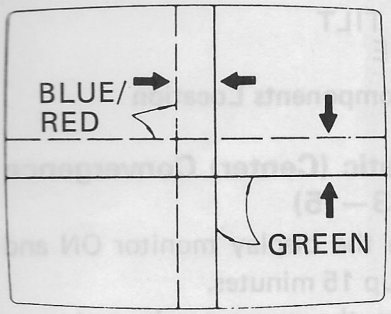


Figure 15. Static (Center) Convergence

4.12 Dynamic Convergence (Figs. 16–18)

Dynamic convergence (convergence of the three color fields at the edges of the CRT screen) is accomplished by proper insertion and positioning of three rubber wedges between the edge of the deflection yoke and the funnel of the CRT.

This is accomplished in the following manner:

1. Switch the display monitor ON and allow it to warm up for 15 minutes.
2. Apply the crosshatch pattern from the computer to display monitor. Observe spacing between lines around the edges of the CRT.
3. Tilt the deflection yoke up and down. Insert tilt adjustment wedges ① and ② between the deflection yoke and the CRT until the misconvergence illustrated in Figure 16 has been corrected.
4. Tilt the deflection yoke right and left. Insert tilt adjustment wedge ③ between the deflection yoke and the CRT until the misconvergence illustrated in Figure 17 has been corrected.
5. Alternately change spacing between, and depth of insertion of, the three wedges until proper dynamic convergence is obtained.
6. Check purity and readjust, if necessary.

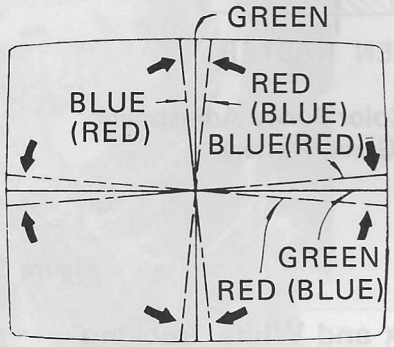


Figure 16.

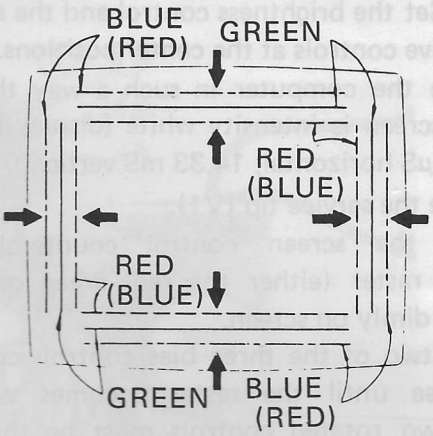


Figure 17.

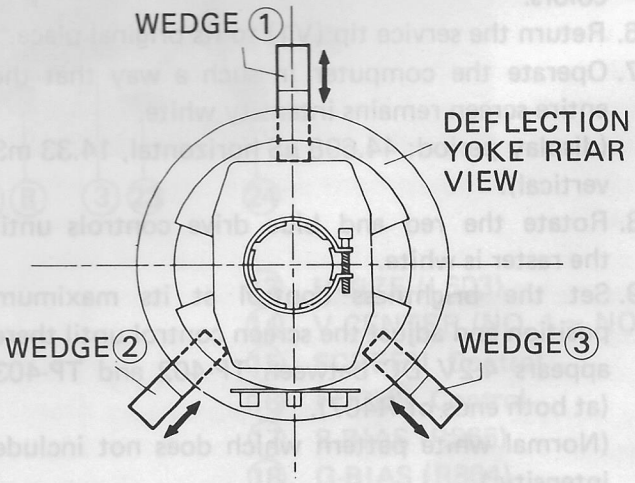
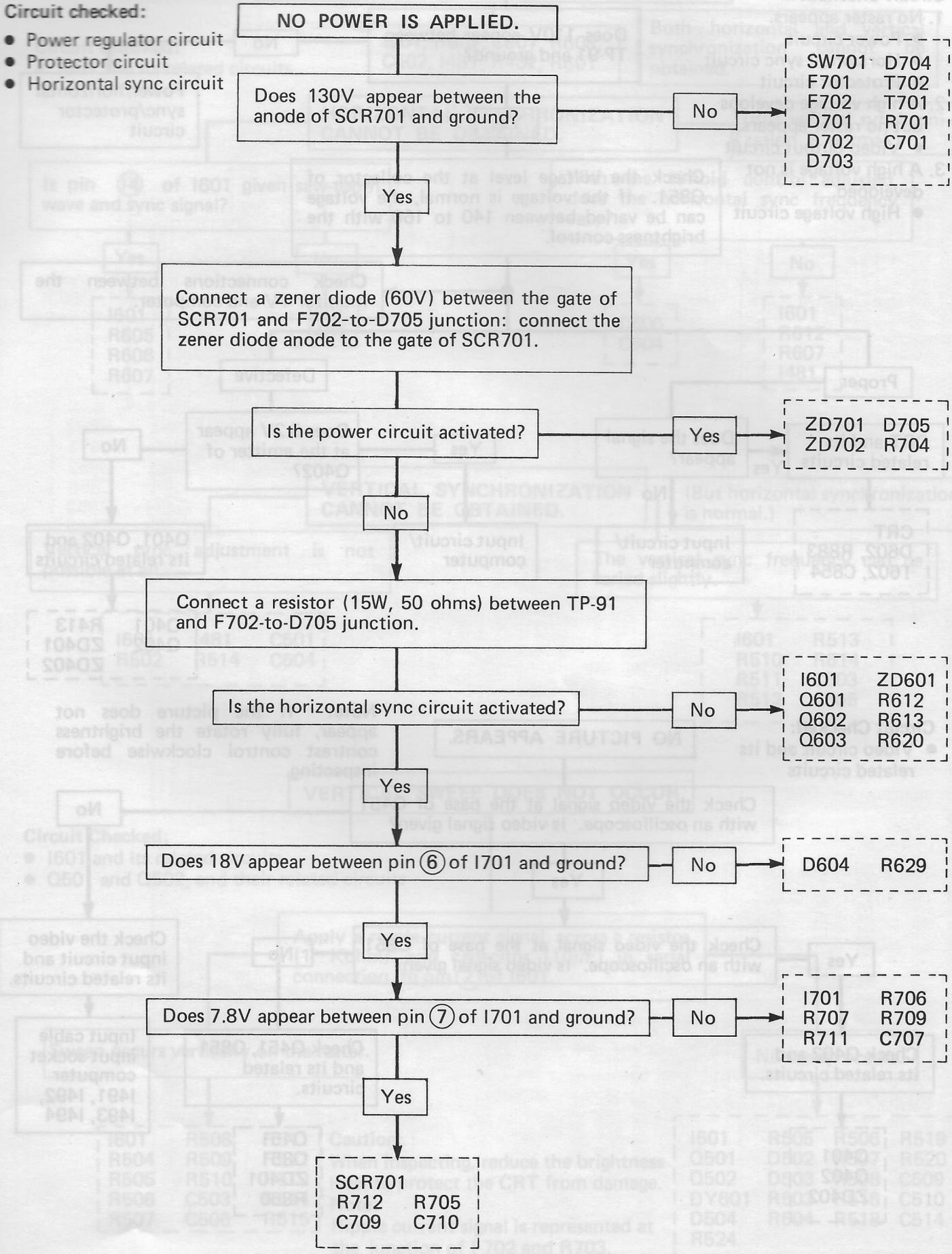


Figure 18. Dynamic Convergence

V. TROUBLESHOOTING GUIDE

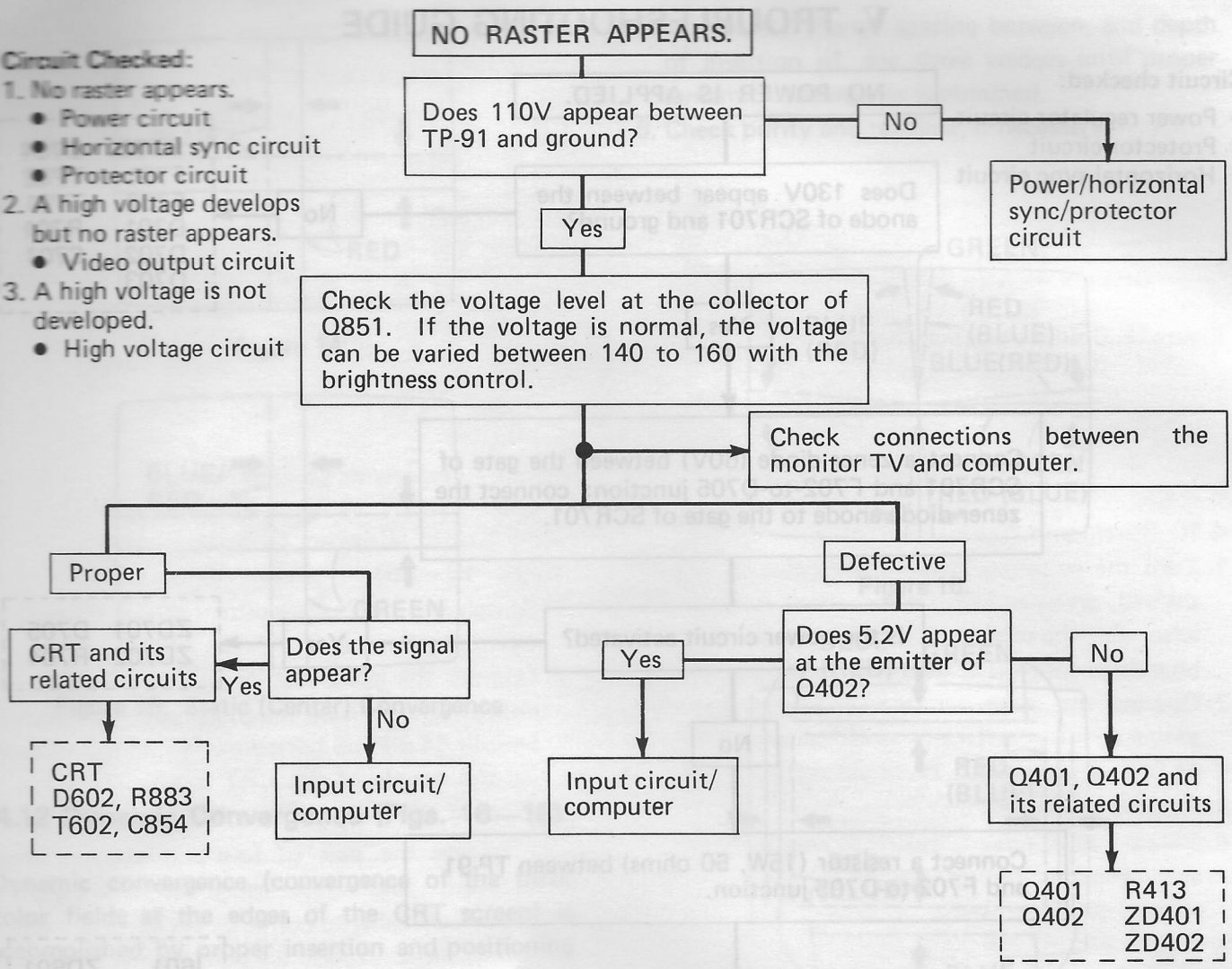
Circuit checked:

- Power regulator circuit
- Protector circuit
- Horizontal sync circuit



Circuit Checked:

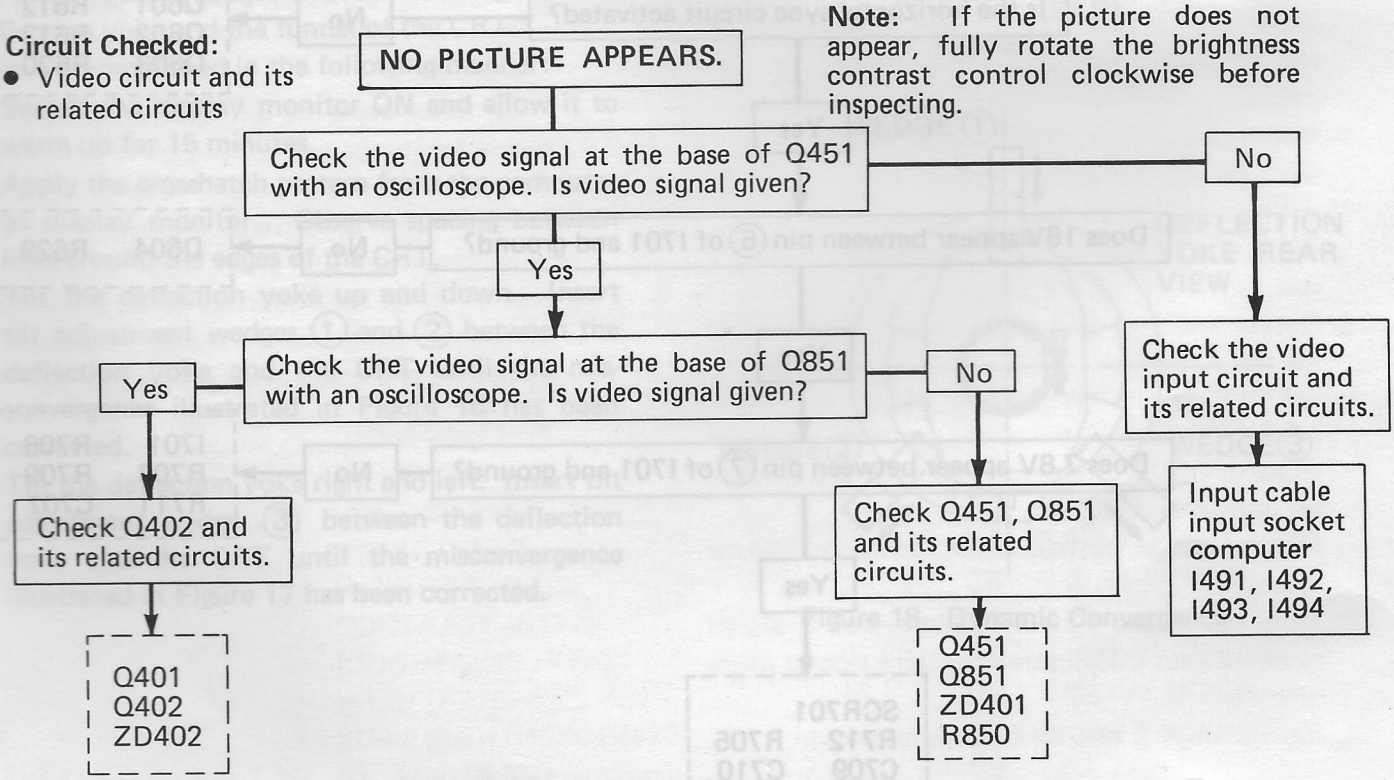
1. No raster appears.
   - Power circuit
   - Horizontal sync circuit
   - Protector circuit
2. A high voltage develops but no raster appears.
   - Video output circuit
3. A high voltage is not developed.
   - High voltage circuit



Circuit Checked:

- Video circuit and its related circuits

Note: If the picture does not appear, fully rotate the brightness contrast control clockwise before inspecting.


NO PICTURE APPEARS.
Check the video signal at the base of Q451 with an oscilloscope. Is video signal given?
No
Check the video input circuit and its related circuits.
Input cable input socket computer I491, I492, I493, I494
Yes
Check the video signal at the base of Q851 with an oscilloscope. Is video signal given?
No
Check Q451, Q851 and its related circuits.
Q451
Q851
ZD401
R850
Yes
Check Q402 and its related circuits.
Q401
Q402
ZD402

NO SYNCHRONIZATION CAN BE PROVIDED.

Circuit Checked:
- I601 and its related circuits.

I601, R602, C601, R608, C602, I481, R482, R601

Both horizontal and vertical synchronization cannot be obtained.

HORIZONTAL SYNCHRONIZATION CANNOT BE OBTAINED.

(But vertical synchronization is normal.)

Is pin ⑭ of I601 given saw-tooth wave and sync signal?

- Yes → I601, R605, R606, R607
- No → I601, I481

With the H-hold control adjusted, does the horizontal sync frequency vary?

- Yes → C606, C604
- No → I601, R612, R607, I481

VERTICAL SYNCHRONIZATION CANNOT BE OBTAINED.

(But horizontal synchronization is normal.)

Vertical sync adjustment is not possible at all.

I601, R502, I481, R514, C501, C504

The vertical sync frequency can be varied slightly.

I601, R510, R511, R512, R513, R514, C503, C505

VERTICAL SWEEP DOES NOT OCCUR

Circuit Checked:
- I601 and its related circuits
- Q501 and Q502, and their related circuits

Apply a ripple current signal, across a resistor (1 Kohm) and capacitor (10μF) in serial connection, to pin ② of I601.

Sweep occurs vertically on the raster.

I601, R504, R505, R506, R507, R508, R509, R510, C503, C506, R511, R512, R513, R514, R515

Caution:
When inspecting, reduce the brightness level to protect the CRT from damage.

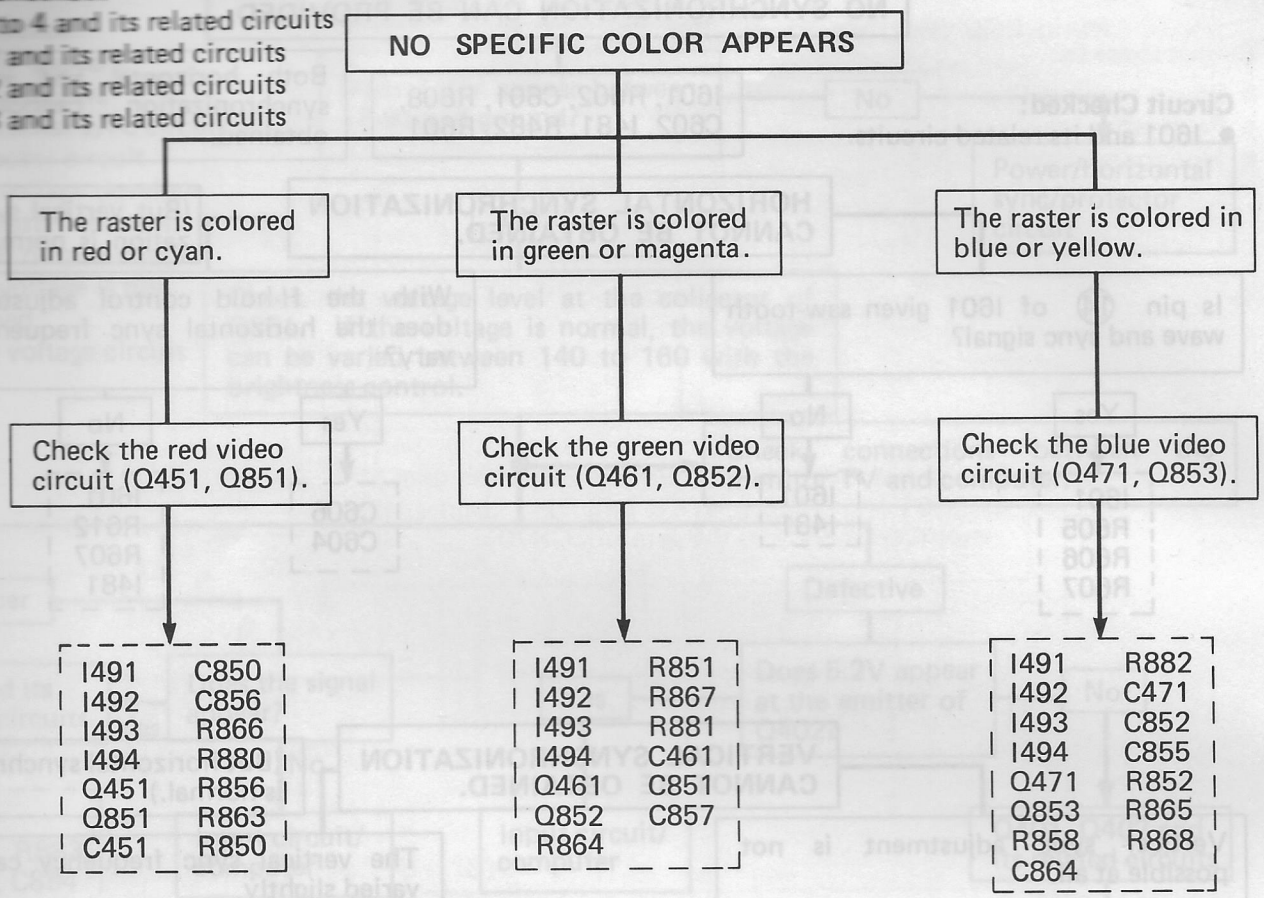
Note:
Ripple current signal is represented at the junction of F702 and R703.

No sweep occurs.

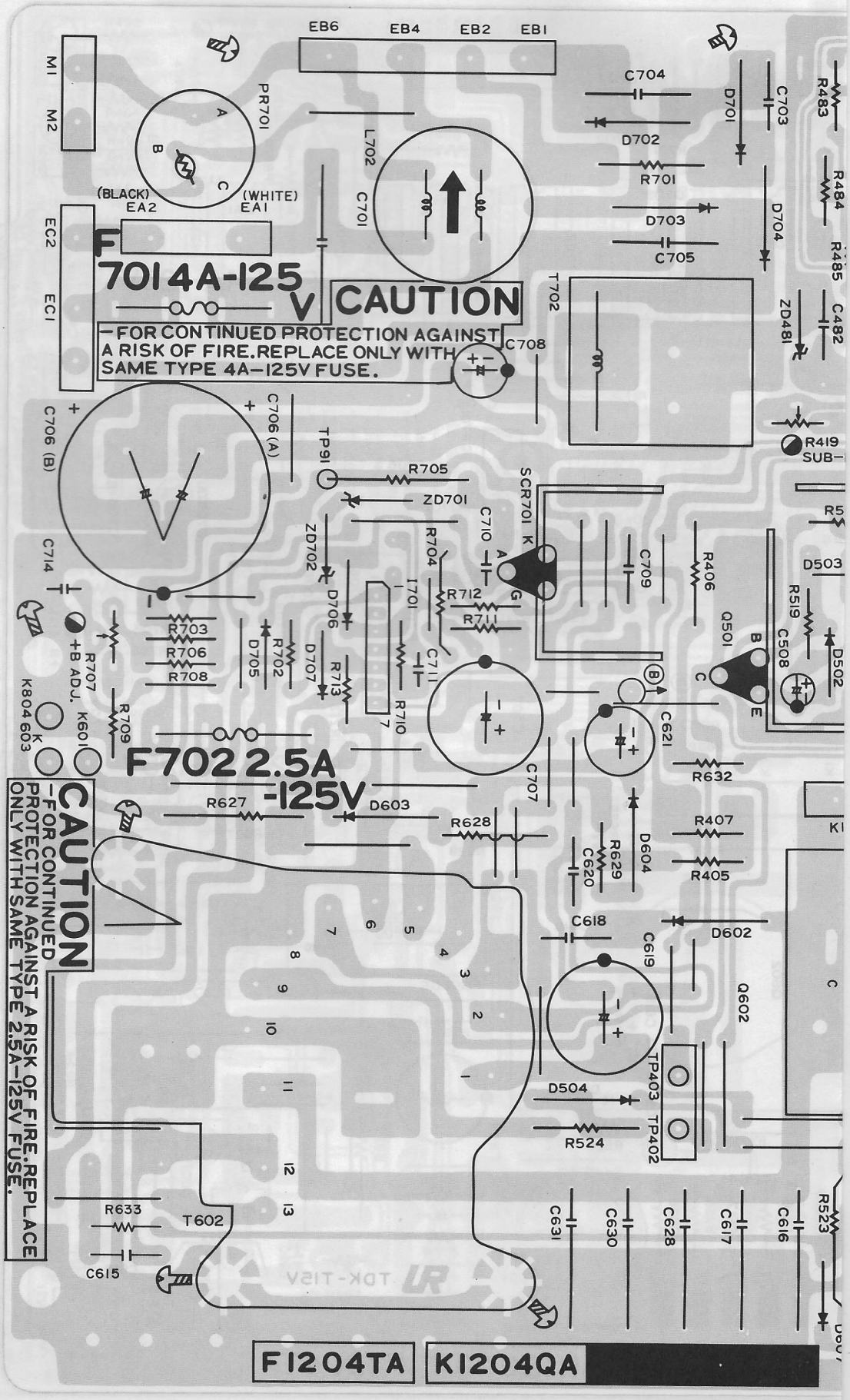
I601, Q501, Q502, DY601, D504, R524, R505, D502, D503, R503, R504, R506, R507, R508, R516, R518, R519, R520, C509, C510, C514

Circuit Checked:

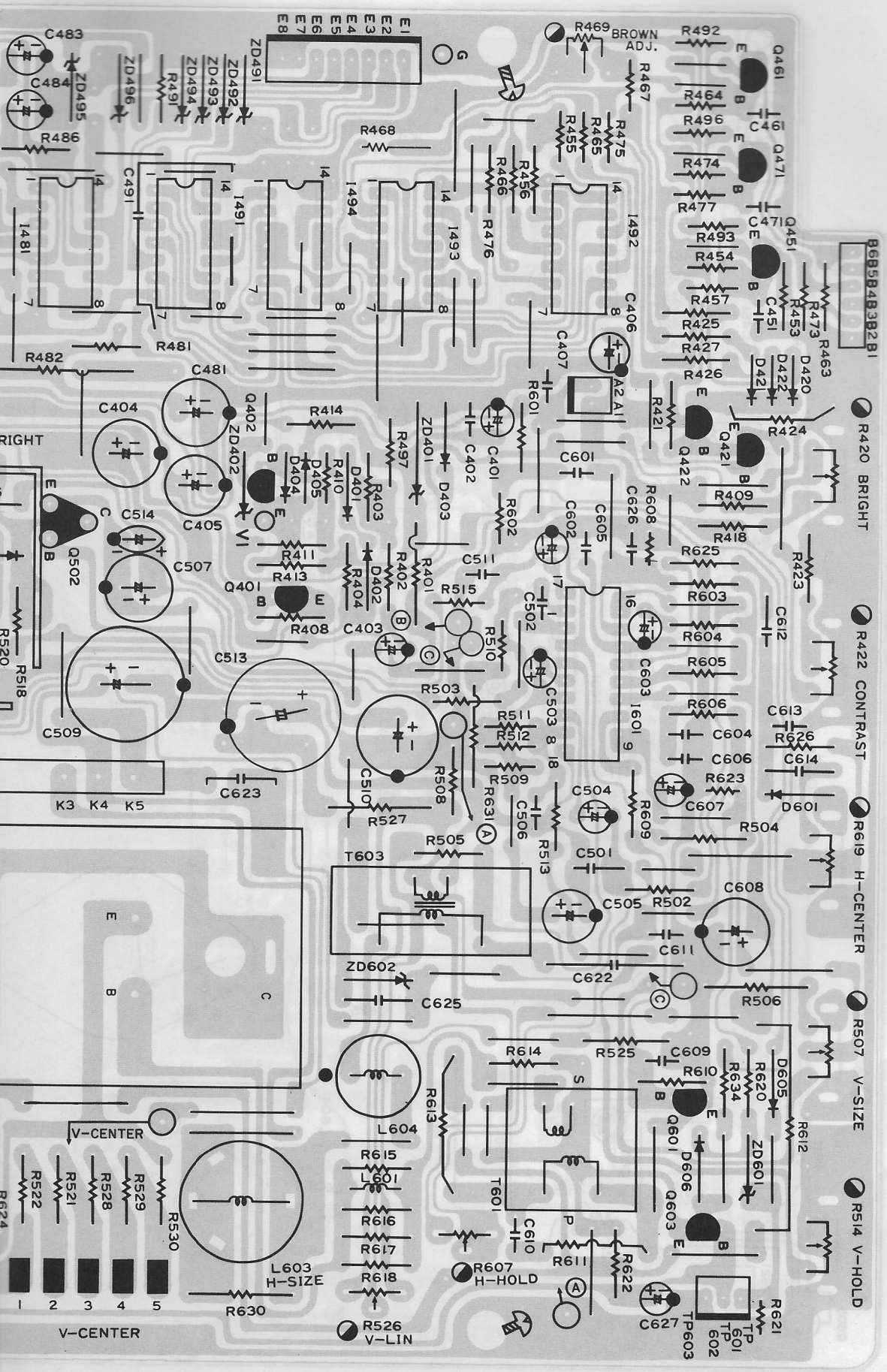
- I491 to 4 and its related circuits
- Q851 and its related circuits
- Q852 and its related circuits
- Q853 and its related circuits



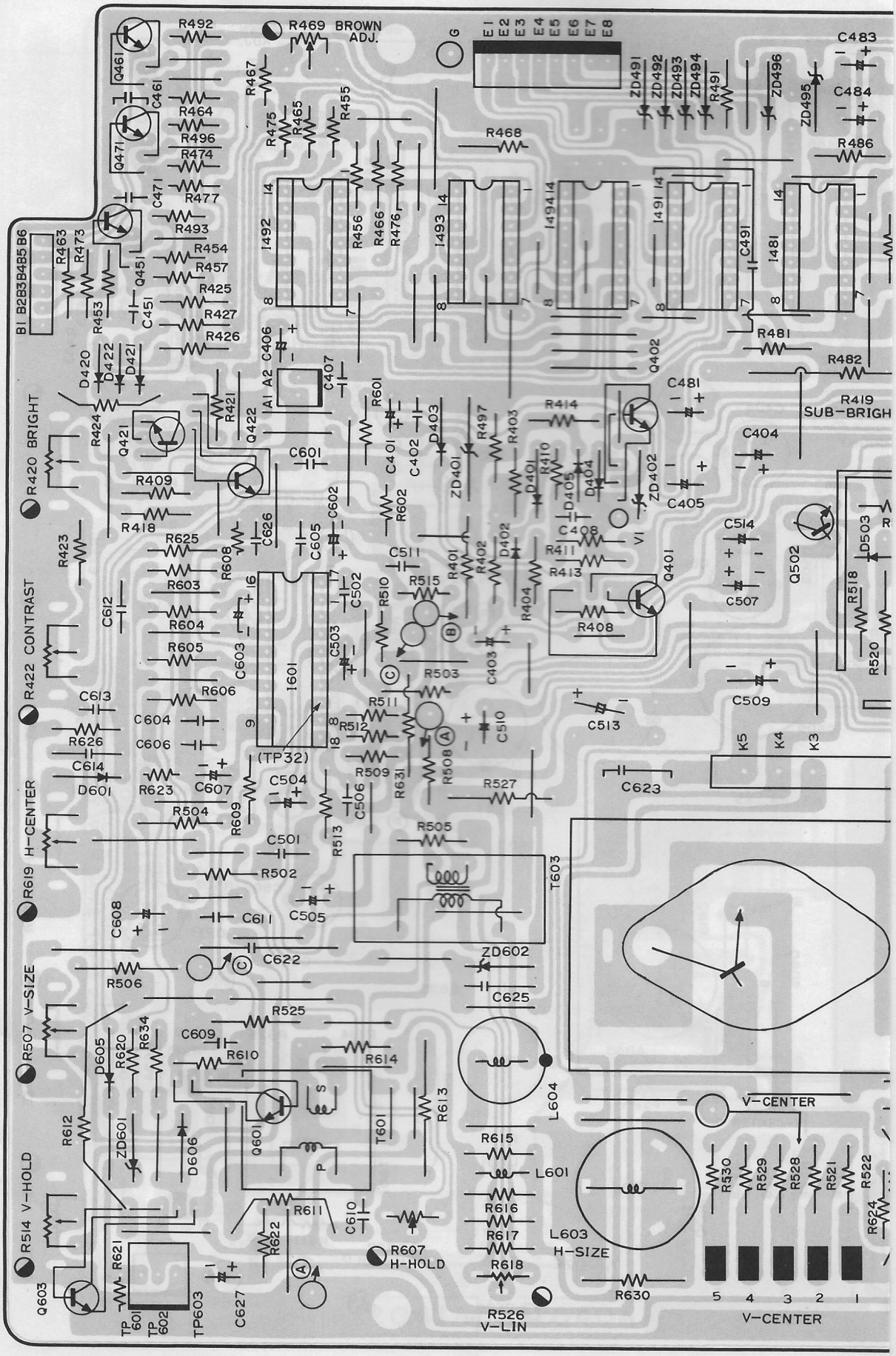
Main PCB (Top View)



nd Bottom Views)

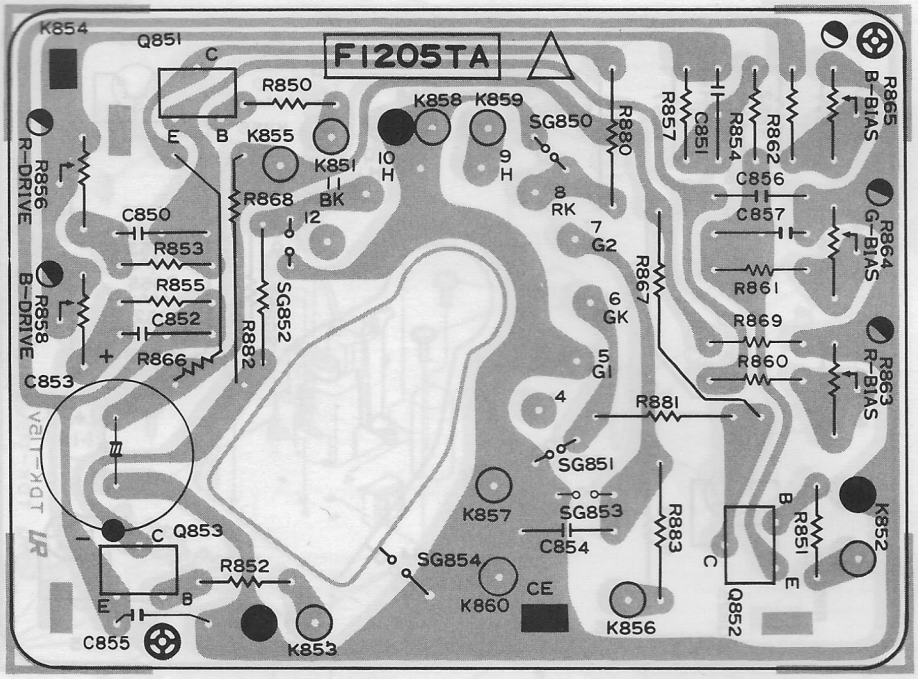


Main PCB (Bottom View)

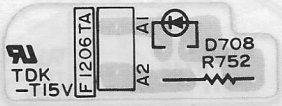


EB1
EB2
EB4
EB6
C704
D702
R701
D703
C705
T702
L702
PR701
(WHITE)
EA1
(BLACK)
EA2
M1
M2
EC1
EC2
C701
F701 4A-125V
(TP701)
C708
SCR701
TP91
R705
ZD701
C706(A)
C706(B)
C714
R406
C709
C710
R704
R712
R711
Q501
C508
R519
D706
ZD702
R703
R706
R708
R702
D705
R707
+B ADJ.
C711
R710
I701
D707
R713
C707
C621
R632
F702 2.5A-125V
K601
K603
K804
R709
D603
R627
R628
R629
D604
R407
R405
C620
D602
C618
Q602
C619
TP403
TP402
D504
R524
(TP64)
C616
C617
C628
C630
C631
R523
R633
C615
T602
F.B.T
TDK-T15V
K1204QA
F1204TA

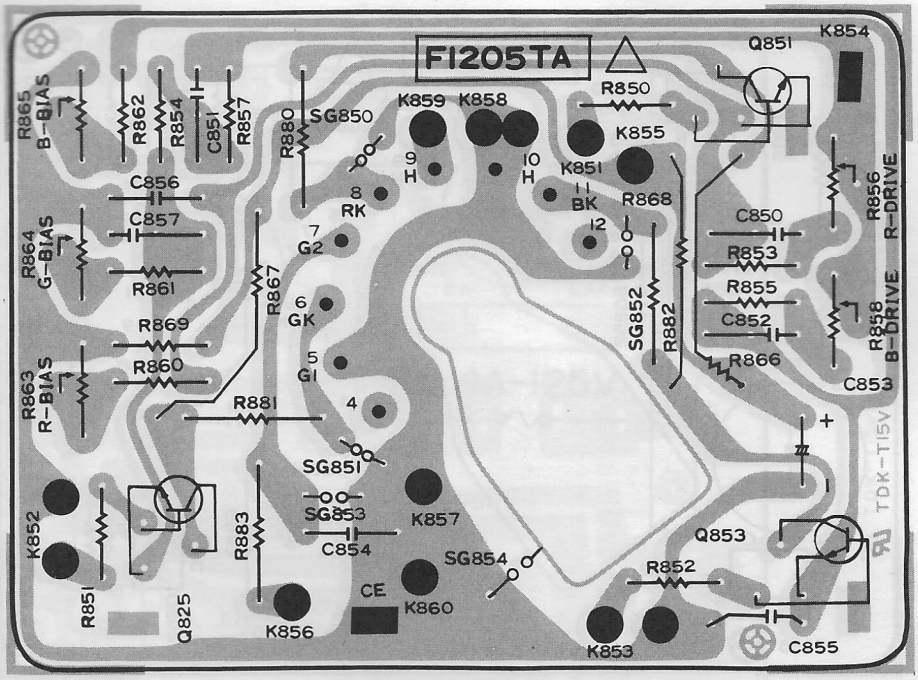
CRT Socket PCB (Top View)



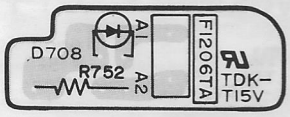
LED PCB (Top View)

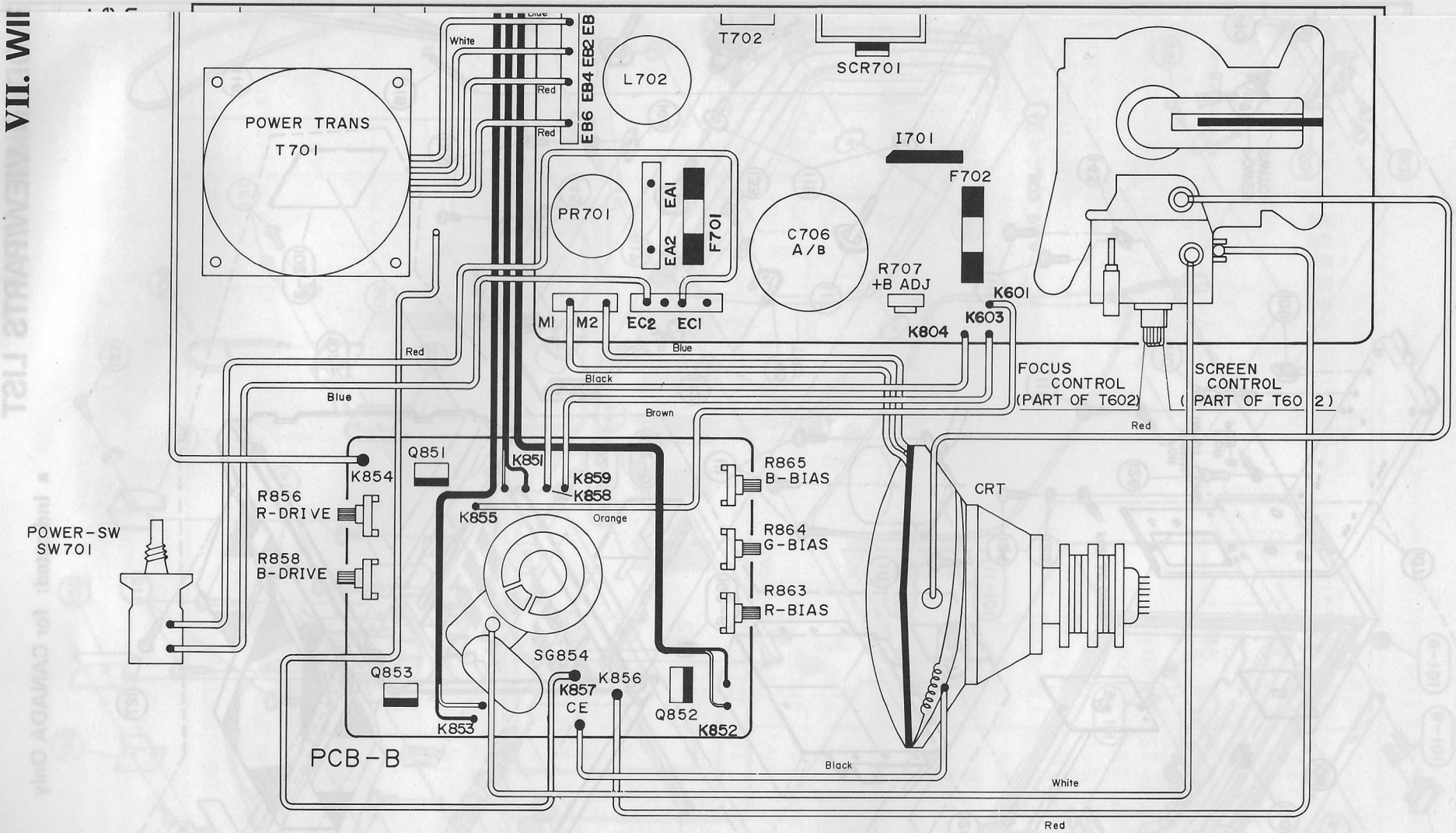


CRT Socket PCB (Bottom View)



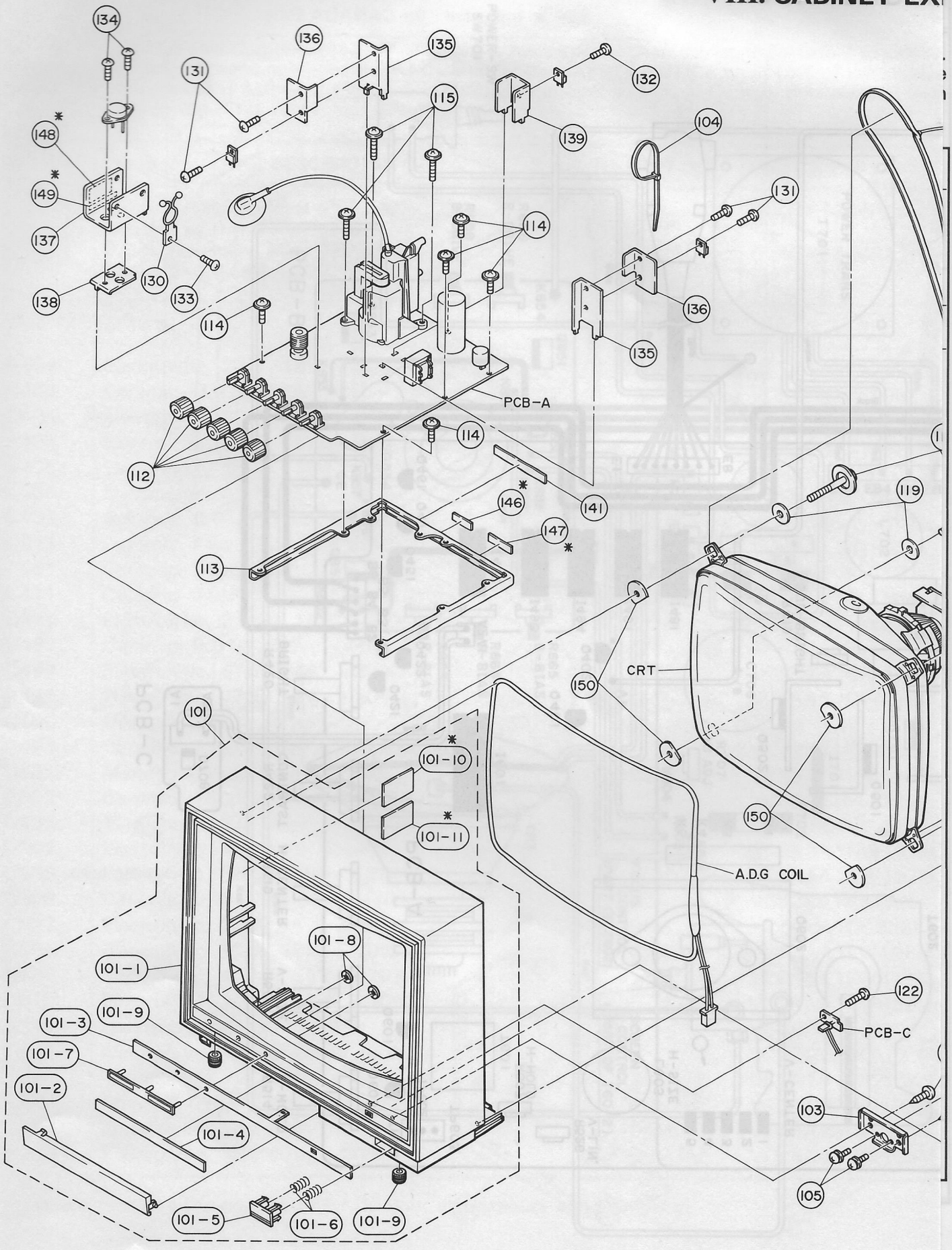
LED PCB (Bottom View)




POWER TRANS
T701
PR701
L702
T702
SCR701
I701
F702
C706
A/B
R707
+B ADJ
K601
K603
K804
EB6 EB4 EB2 EB
EA1
EA2
F701
M1 M2 EC2 EC1
White
Red
Red
Red
Blue
Black
Blue
Brown
Red
FOCUS
CONTROL
(PART OF T602)
SCREEN
CONTROL
(PART OF T602)
Q851
K851
K854
K859
K858
K855
Orange
R856
R-DRIVE
R858
B-DRIVE
POWER-SW
SW701
R865
B-BIAS
R864
G-BIAS
R863
R-BIAS
CRT
SG854
Q853
K857
K856
CE
Q852
K852
K853
PCB-B
Black
White
Red

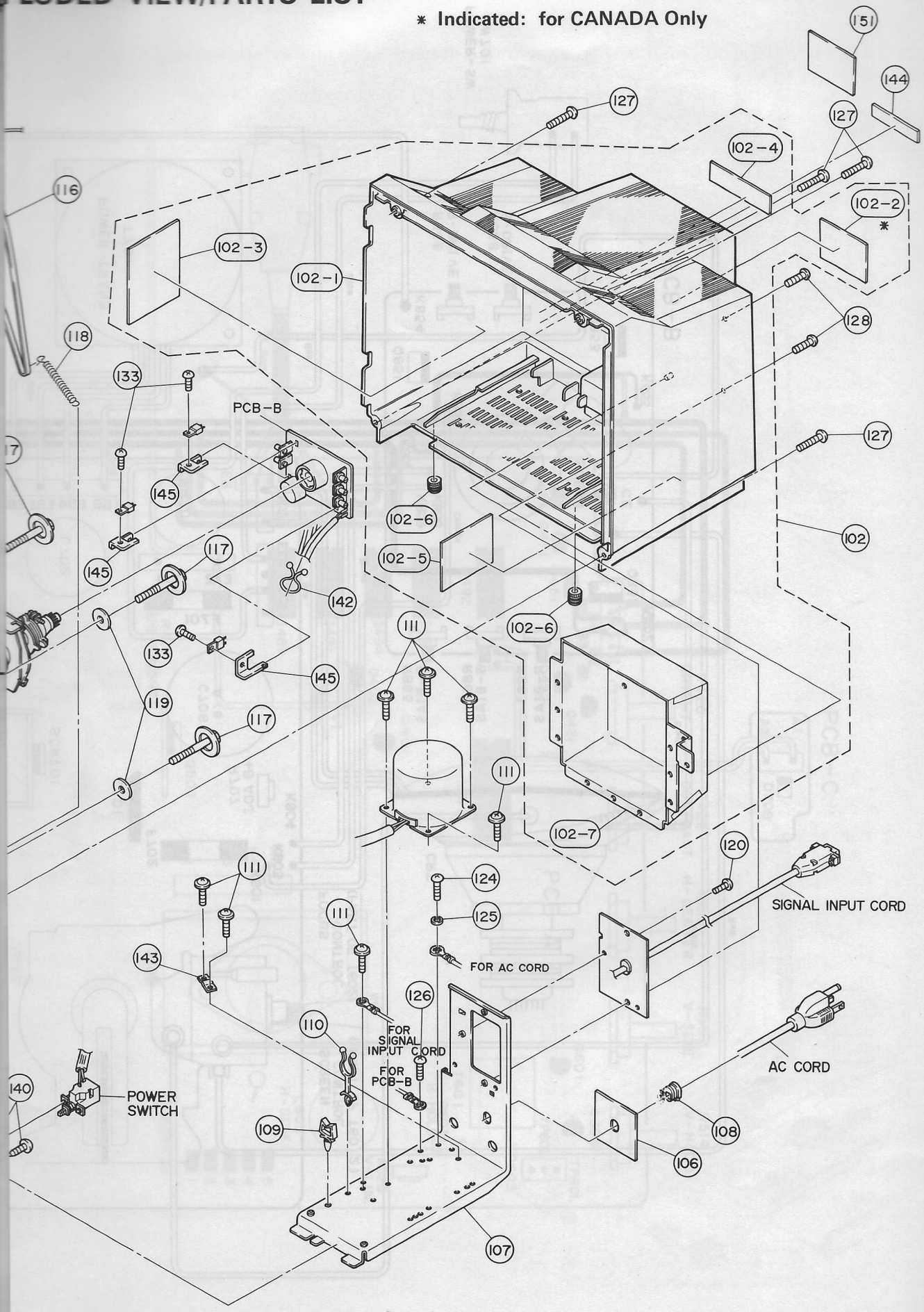
RING DIAGRAM

VIII. CABINET EX



PLODED VIEW/PARTS LIST

* Indicated: for CANADA Only



8.1 Electrical Parts List

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the SAFETY NOTICE on page 5 of the service manual. Don't degrade the safety of the product through improper servicing. Components marked with an ▲ are related to the X-ray protection circuit.

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	P.C.B. Assembly, Main (PCB-A)	AX-9495	DUNTK1204RA0H
	Consists of the following: (U.S.A.)		
	P.C.B. Assembly, Main (PCB-A)		DUNTK1204RA2H
	Consists of the following: (CANADA)		
CAPACITORS			
C401	Electrolytic, 22μF, 16V, ±20%	CC-226MOAP	VCEAAA1CW226M
C402	Ceramic, 0.01μF, 50V, +80−20%	CC-103ZJCP	VCKZPA1HF103Z
C403	Electrolytic, 10μF, 50V, ±20%	CC-106MJAP	VCEAAA1HW106M
C404	Electrolytic, 47μF, 16V, ±20%		VCEAAA1CW476M
C405	Electrolytic, 100μF, 25V, ±20%	CC-107MFAP	VCEAAA1EW107M
C406	Electrolytic, 47μF, 25V, ±20%		VCEAAA1EW476M
C407	Ceramic, 0.01μF, 50V, +80−20%	CC-103ZJCP	VCKZPA1HF103Z
C451	Ceramic, 15pF, 50V, ±5%	CC-150JJCP	VCCSPA1HL150J
C461	Ceramic, 15pF, 50V, ±5%	CC-150JJCP	VCCSPA1HL150J
C471	Ceramic, 15pF, 50V, ±5%	CC-150JJCP	VCCSPA1HL150J
C481 ⚠	Electrolytic, 220μF, 16V, ±20%	CC-227MOAP	VCEAAA1CW227M
C482	Ceramic, 0.01μF, 50V, ±10%	CC-103KJCP	VCKZPA1HB103K
C483	Electrolytic, 47μF, 16V, ±20%		VCEAAA1CW476M
C484	Electrolytic, 47μF, 16V, ±20%		VCEAAA1CW476M
C490	Not Used		
C491	Ceramic, 0.1μF, 25V, +80−20%		VCTYPU1EF104Z
C501	Mylar*, 0.056μF, 50V, ±10%	CC-563KJMP	VCQYSH1HM563K
C502	Ceramic, 180pF, 50V, ±5%		VCCSPA1HL181J
C503	Tantalum, 2.2μF, 35V, ±10%	CC-225KGTP	VCSATA1VE225K
C504	Electrolytic, 1μF, 50V, ±20%	CC-105MJAP	VCEAAA1HW105M
C505	Electrolytic, 100μF, 16V, ±20%	CC-107MOAP	VCEAAA1CW107M
C506	Ceramic, 0.0047μF, 50V, ±10%	CC-472KJCP	VCKZPA1HB472K
C507	Electrolytic, 33μF, 16V, ±10%	CC-336KDAP	VCEACA1CC336K
C508	Electrolytic, 10μF, 25V, ±20%	CC-106MFAP	VCEAAA1EW106M
C509	Electrolytic, 470μF, 25V, ±20%	CC-477MFAP	VCEAAA1EW477M
C510	Electrolytic, 330μF, 50V, ±20%	CC-337MJAP	VCEAAA1HW337M
C511	Ceramic, 39pF, 50V, ±5%		VCCSPA1HL390J
C513	Electrolytic, 3300μF, 6.3V, ±20%		RC-EZ0170TAZZ
C514	Tantalum, 2.2μF, 35V, ±10%	CC-225KGTP	VCSATA1VE225K
C601	Mylar, 0.018μF, 50V, ±10%	CC-183KJMP	VCQYSH1HM183K
C602	Electrolytic, 10μF, 16V, ±20%	CC-106MDAP	VCEAAA1CW106M
C603	Electrolytic, 1μF, 50V, ±20%	CC-105MJAP	VCEAAA1HW105M

*Mylar is a registered trademark of E.I.Du pont de Nemours and Company.

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C604	Polypro Film, 0.0027μF, 100V, ±2%	CC-272GLHP	VCQPSA2AA272G
C605	Mylar, 0.0068μF, 50V, ±10%	CC-682KJMP	VCQYSH1HM682K
C606	Mylar, 0.0022μF, 50V, ±10%	CC-222KJMP	VCQYSH1HM222K
C607	Electrolytic, 10μF, 16V, ±20%	CC-106MDAP	VCEAAA1CW106M
C608	Electrolytic, 220μF, 16V, ±20%		VCEAAA1CW227M
C609	Ceramic, 0.001μF, 50V, ±10%	CC-102KJCP	VCKZPA1HB102K
C610	Ceramic, 0.001μF, 500V, ±10%	CC-102KUCP	VCKYPA2HB102K
C611	Ceramic, 0.01μF, 50V, ±10%	CC-103KJCP	VCKZPA1HB103K
C612	Mylar, 0.056μF, 50V, ±10%	CC-563KJMP	VCQYSH1HM563K
C613	Mylar, 0.027μF, 50V, ±10%	CC-273KJMP	VCQYSH1HM273K
C614	Ceramic, 0.001μF, 50V, ±10%		VCKYAT1HB102K
C615	Ceramic, 0.01μF, 500V, ±10%	CC-103KUCP	VCKYPB2HB103K
C616 ▲⚠	Metalized Polypro, 0.0015μF, 1.6kV, ±5%	CC-152JYHP	VCFPPB3CA152J
C617 ▲⚠	Metalized Polypro, 0.0015μF, 1.6kV, ±5%	CC-152JYHP	VCFPPB3CA152J
C618	Ceramic, 0.001μF, 250V(AC)/1.4kV(DC), ±5%	CC-103JYCP	RC-KZ007JCEZZ
C619 ⚠	Electrolytic, 100μF, 160V, ±20%	CC-107MNAP	VCEAAH2CW107M
C620	Mylar, 0.1μF, 50V, ±10%	CC-104KJMP	VCQYSH1HM104K
C621 ⚠	Electrolytic, 330μF, 25V, ±20%	CC-337MFAP	VCEAAA1EW337M
C622 ⚠	Metalized Polypro, 0.47μF, 200V, ±5%	CC-474JPHP	VCFPPD2DB474J
C623	Ceramic, 0.01μF, 500V, ±10%	CC-103KUCP	VCKYPB2HB103K
C625	Ceramic, 0.001μF, 50V, ±10%		VCKYAT1HB102K
C626	Ceramic, 82pF, 50V, ±5%		VCCSPA1HL820J
C627	Electrolytic, 3.3μF, 50V, ±20%	CC-335MJAP	VCEAAA1HW335M
C628 ▲⚠	Metalized Polypro, 0.0015μF, 1.6kV, ±5%	CC-152JYHP	VCFPPB3CA152J
C630 ▲⚠	Metalized Polypro, 0.0015μF, 1.6kV. ±5%	CC-152JYHP	VCFPPB3CA152J
C631 ▲⚠	Metalized Polypro, 0.0015μF, 1.6kV, ±5%	CC-152JYHP	VCFPPB3CA152J
C701 ⚠	Across Line, 0.22μF, 125V(AC), ±20%	AC-0991	RC-QZ019DCEZZ
C703	Ceramic, 0.01μF, 250V(AC)/1.4kV(DC), ±5%	CC-103JYCP	RC-KZ007JCEZZ
C704	Ceramic, 0.01μF, 250V(AC)/1.4kV(DC), ±5%	CC-103JYCP	RC-KZ007JCEZZ
C705	Ceramic, 0.01μF, 500V, ±10%	CC-103KUCP	VCKYPB2HB103K
C706(A) ⚠	Electrolytic, 470μF, 200V, ±20%	CF-7470	RC-EZ0124TAZZ
C706(B) ⚠	Electrolytic, 330μF, 200V, ±20%	CF-7470	RC-EZ0124TAZZ
C707 ⚠	Electrolytic, 100μF, 160V, ±20%	CC-107MNAP	VCEAAH2CW107M
C708	Electrolytic, 47μF, 50V, ±20%	CC-476MJAP	VCEAAA1HW476M
C709	Polypro Film, 0.047μF, 200V, ±10%	CC-473KPHP	VCQPSB2DA473K
C710	Ceramic, 0.0047μF, 500V, ±10%	CC-472KUCP	VCKYPA2HB472K
C711 ▲⚠	Ceramic, 0.01μF, 50V, ±10%	CC-103KJCP	VCKZPA1HB103K
C714	Ceramic, 0.022μF, 50V, +80−20%	CC-223ZJCP	VCKZPA1HF223Z
CONNECTORS			
M	Plug, ADG coil 2-pin	J-7460	QPLGN0207CEZZ
A	Plug, LED, 2-pin	J-7513	QPLGN0213GEZZ

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
EC	Plug, power switch, 4-pin	AJ-7597	QPLGN0404CEZZ
EA	Plug, AC input, 3-pin	J-7514	QPLGN0304CEZZ
TP402/ 403	Plug, X-Ray Protector Check, 3-pin		QPLGN0313GEZZ
EB	Plug, power transformer, 4-pin	AJ-7598	QPLGN0408CEZZ
K	Plug, Detection yoke, 5-pin	J-7461	QPLGN0505CEZZ
E	Plug, Video input terminal, 8-pin	AJ-7621	QPLGN0805CEZZ
DIODES			
D401	1S2471 Silicon	DX-2447	RH-DX0046CEZZ
D402	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D403	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D404	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D405	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D420	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D421	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D422	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D502	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D503	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D504 ⚠	TVR1J Silicon		RH-DX0105TAZZ
D601	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D602	ERB26-20 Silicon	DX-2449	RH-DX0100CEZZ
D603 ⚠	RH1S Silicon	DX-2275	RH-DX0086TAZZ
D604 ⚠	RF1 Silicon	DX-2450	RH-DX0101CEZZ
D605	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D606	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D607	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D701 ⚠	1S1887 Silicon	DX-2432	RH-DX0038CEZZ
D702 ⚠	1S1887 Silicon	DX-2432	RH-DX0038CEZZ
D703 ⚠	1S1887 Silicon	DX-2432	RH-DX0038CEZZ
D704 ⚠	1S1887 Silicon	DX-2432	RH-DX0038CEZZ
D705	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
D706	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
D707	1S2473 Silicon	DX-0684 or DX-2448	RH-DX0048CEZZ
ZD401	Zener AW08-12	DX-2451	RH-EX0061CEZZ
ZD402	Zener RD 9.1EB	DX-0402	RH-EX0041TAZZ
ZD481	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD491	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD492	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD493	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD494	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD495	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD496	Zener RD 5.1EB	DX-0398	RH-EX0049CEZZ
ZD601 ⚠▲	Zener HZ18-2	DX-2452	RH-EX0112CEZZ
ZD602	Zener RD 12E	DX-2311	RH-EX0047CEZZ
ZD701 ⚠▲	Zener HZ30	DX-2453	RH-EX0043CEZZ
ZD702 ⚠▲	Zener HZ30	DX-2453	RH-EX0043CEZZ
SCR701 ▲⚠	Silicon Controlled Rectifier S6192F	DX-2454	VHSS6192FLB1E
FUSES			
F701 ⚠	4A	HF-1193	QFS-B4021GEZZ
F702 ⚠	2.5A	AHF-1302	QFS-B2521GEZZ
INTEGRATED CIRCUITS			
I481	IC HD74LS136P Quad. Exclusive OR Gate (OC)		VHIHD74LS136P
I491	IC SN74S04N Inverter, Bipolar Linear	AMX-4945	VHISN74S04/-1
I492	IC HD7406 Inverter, Bipolar Linear (OC)	AMX-4591	VHIHD7406//-1
I493	IC HD7426 Quad. Dual Input NAND GATE (High-Voltage)	MX-4297	VHIHD7426//-1
I494	IC SN74S11N Intensity, Bipolar Linear	MX-6406	VHISN74S11/-1
I601 ▲⚠	IC HA11235 SYNC. AFC, X-Ray Protector, Vertical/Horizontal Osc., Vertical Driver, Bipolar Linear	MX-6452	RH-IX0065CEZZ
I701 ▲⚠	IC T2058 Power Regulator, Bipolar Linear	MX-6092	RH-IX0137CEZZ
COILS			
L601	Fixed, 12μF	ACA-8371	VP-LK120K0000
L603	H-Size	ACA-8372	RCILZ0175TAZZ
L604	Line Filter	ACA-8373	RCILZ0213CEZZ
L702 ⚠	Line Filter	ACA-8374	RCILF0049CEZZ
TRANSISTORS			
Q401	2SA1015(Y) A.B.L., Silicon PNP	2SA-1015	VS2SA1015Y/1E
Q402	2SA854(Q) Blanking, Silicon PNP	2SA-854Q	VS2SA854-Q/1E

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
Q421	2SC1815(Y) Contrast Circuit, Silicon NPN	2SC-1815Y	VS2SC1815YW-1
Q422	2SC1815(Y) Contrast Circuit, Silicon NPN	2SC-1815Y	VS2SC1815YW-1
Q451	2SC1815(Y) Red Amp., Silicon NPN	2SC-1815Y	VS2SC1815YW-1
Q461	2SC1815(Y) Green Amp., Silicon NPN	2SC-1815Y	VS2SC1815YW-1
Q471	2SC1815(Y) Blue Amp., Silicon NPN	2SC-1815Y	VS2SC1815YW-1
Q501	2SC1826 (G) Vertical Output, Silicon NPN	2SC-1826	VS2SC1826GL2E
Q502	2SC1826 (G) Vertical Output, Silicon NPN	2SC-1826	VS2SC1826GL2E
Q601	2SC2482 Horizontal Driver, Silicon NPN	2SC-2482	VS2SC2482//-1
Q602 ⚠	2SD869 Horizontal Output, Silicon NPN	2SD-869	VS2SD869-//1E
Q603	2SC1815(GR) X-Ray Protector, Silicon NPN	2SC-1815GR	VS2SC1815GW-1
RESISTORS: Unless otherwise specified, resistors are 1/4W, ±5%, carbon type.			
R401 ⚠	Oxide Film, 270 ohm, 1W, ±5%	N-0155EGD	VRS-PV3AB271J
R402	390 ohm	N-0162EEC	VRD-RA2EE391J
R403	12K ohm	N-0288EEC	VRD-RA2EE123J
R404	5.6K ohm	N-0257EEC	VRD-RA2EE562J
R405	10K ohm	N-0281EEC	VRD-RA2EE103J
R406	Oxide Film, 3.9K ohm, 1W, ±5%	N-0237EED	VRS-PV3AB392J
R407	10K ohm	N-0281EEC	VRD-RA2EE103J
R408	1.2K ohm		VRD-RA2EE122J
R409	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R410	Carbon, 120 ohm, 1/8W, ±5%		VRD-RA2BE121J
R411	1.5K ohm	N-0206EEC	VRD-RA2EE152J
R413	470 ohm	N-0169EEC	VRD-RA2EE471J
R414	1K ohm	N-0196EEC	VRD-RA2EE102J
R418	1.8K ohm	N-0210EEC	VRD-RA2EE182J
R419	*See* Controls		
R420	*See* Controls		
R421	1.2K ohm	N-0199EEC	VRD-RA2EE122J
R422	*See* Controls		
R423	270 ohm	N-0155EEC	VRD-RA2EE271J
R424	Oxide Film, 470 ohm, 1W, ±5%		VRS-PV3AB471J
R425	Carbon, 270 ohm, 1/2W, ±5%		VRD-RA2HD271J
R426	Carbon, 270 ohm, 1/2W, ±5%		VRD-RA2HD271J
R427	Carbon, 270 ohm, 1/2W, ±5%		VRD-RA2HD271J
R453	470 ohm	N-0169EEC	VRD-RA2EE471J
R454	Carbon, 1.5K ohm, 1/8W, ±5%		VRD-RA2BE152J
R455	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R456	8.2K ohm	N-0271EEC	VRD-RA2EE822J
R457	Carbon, 680 ohm, 1/8W, ±5%		VRD-RA2BE681J
R463	470 ohm	N-0169EEC	VRD-RA2EE471J
R464	Carbon, 1.5K ohm, 1/8W, ±5%		VRD-RA2BE152J
R465	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R466	8.2K ohm	N-0271EEC	VRD-RA2EE822J

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R467	Carbon, 680 ohm, 1/8W, ±5%		VRD-RA2BE681J
R468	Not Used		
R469	*See* Controls		
R473	470 ohm	N-0169EEC	VRD-RA2EE471J
R474	Carbon, 1.5K ohm, 1/8W, ±5%		VRD-RA2BE152J
R475	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R476	8.2K ohm	N-0271EEC	VRD-RA2EE822J
R477	Carbon, 680 ohm, 1/8W, ±5%		VRD-RA2BE681J
R481	1K ohm	N-0196EEC	VRD-RA2EE102J
R482 ⚠	Oxide Film, 82 ohm, 3W, ±5%	N-0122EJD	VRS-VV3LB820J
R483	1K ohm	N-0196EEC	VRD-RA2EE102J
R484	1K ohm	N-0196EEC	VRD-RA2EE102J
R485	1K ohm	N-0196EEC	VRD-RA2EE102J
R486	1K ohm	N-0196EEC	VRD-RA2EE102J
R491	560 ohm	N-0176EEC	VRD-RA2EE561J
R492	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R493	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R496	Carbon, 820 ohm, 1/8W, ±5%		VRD-RA2BE821J
R497	330 ohm	N-0159EEC	VRD-RA2EE331J
R502	2.2K ohm	N-0216EEC	VRD-RA2EE222J
R503	390 ohm	N-0162EEC	VRD-RA2EE391J
R504	2.7K ohm	N-0224EEC	VRD-RA2EE272J
R505	10K ohm	N-0281EEC	VRD-RA2EE103J
R506 ⚠	Oxide Film, 82 ohm, 1/2W, ±5%	N-0122EED	VRS-PU2HB820J
R507	*See* Controls		
R508	Carbon, 3.9 ohm, 1/2W, ±5%	N-0040EFC	VRD-RA2HD3R9J
R509	Carbon, 4.7K ohm, 1/8W, ±5%		VRD-RA2BE472J
R510	Carbon, 390 ohm, 1/8W, ±5%		VRD-RA2BE391J
R511	Carbon, 12K ohm, 1/8W, ±5%		VRD-RA2BE123J
R512	Carbon, 47K ohm, 1/8W, ±5%		VRD-RA2BE473J
R513	3.3K ohm	N-0230EEC	VRD-RA2EE332J
R514	*See* Controls		
R515	Carbon, 6.8K ohm, 1/8W, ±5%		VRD-RA2BE682J
R516	3.3K ohm	N-0230EEC	VRD-RA2EE332J
R518	Carbon, 5.6 ohm, 1/2W, ±5%	N-0052EFC	VRD-RA2HD5R6J
R519	Carbon, 390 ohm, 1/2W, ±5%	N-0162EFC	VRD-RA2HD391J
R520	Oxide Film, 390 ohm, 1W, ±5%	N-0162EGD	VRS-PV3AB391J
R521	Carbon, 220 ohm, 1/2W, ±5%	N-0149EFC	VRD-RA2HD221J
R522	Carbon, 150 ohm, 1/2W, ±5%		VRD-RA2HD151J
R523 ⚠	Oxide Film, 680 ohm, 2W, ±5%	N-0183EHD	VRS-PV3DB681J
R524 ⚠	Metal Film, 15 ohm, 1/2W, ±5%		VRS-VV3DB150J
R525	82 ohm	N-0122EEC	VRD-RA2EE820J
R526	*See* Controls		
R527	Metal Film, 1 ohm, 1W, ±5%		VRN-RV3AA1R0J
R528	Carbon, 470 ohm, 1/2W, ±5%		VRD-RA2HD471J
R529	Carbon, 820 ohm, 1/2W, ±5%		VRD-RA2HD821J

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R530	Carbon, 1.8K ohm, 1/2W, ±5%		VRD-RA2HD182J
R601	1.2K ohm	N-0199EEC	VRD-RA2EE122J
R602	Carbon, 4.7K ohm, 1/8W, ±5%		VRD-RA2BE472J
R603	15K ohm	N-0297EEC	VRD-RA2EE153J
R604	8.2K ohm	N-0271EEC	VRD-RA2EE822J
R605	33K ohm		VRD-RA2EE333J
R606	12K ohm	N-0288EEC	VRD-RA2EE123J
R607	*See* Controls		
R608	680K ohm		VRD-RU2EE684J
R609	470 ohm	N-0169EEC	VRD-RA2EE471J
R610	390 ohm	N-0162EEC	VRD-RA2EE391J
R611	Oxide Film, 4.7K ohm, 1W, ±5%	N-0247EGD	VRS-PV3AB472J
R612 ⚠	Metal Film, 8.2K ohm, 3W, ±5%	N-0271EJD	VRS-VU3LB822J
R613 ⚠	Metal Film, 1.2K ohm, 3W, ±5%		VRS-VV3LB122J
R614	82 ohm	N-0122EEC	VRD-RA2EE820J
R615	Carbon, 12 ohm, 1/2W, ±5%	N-0067EFC	VRD-RA2HD120J
R616	Carbon, 12 ohm, 1/2W, ±5%	N-0067EFC	VRD-RA2HD120J
R617	Carbon, 12 ohm, 1/2W, ±5%	N-0067EFC	VRD-RA2HD120J
R618	Carbon, 12 ohm, 1/2W, ±5%	N-0067EFC	VRD-RA2HD120J
R619	*See* Controls		
R620 ▲⚠	18K ohm	N-0303EEC	VRD-RA2EE183J
R621	22K ohm		VRD-RU2EE223J
R622	10K ohm	N-0281EEC	VRD-RA2EE103J
R623 ▲⚠	10K ohm		VRD-RU2EE103J
R624	68K ohm	N-0354EEC	VRD-RA2EE683J
R625	100 ohm	N-0132EEC	VRD-RA2EE101J
R626	4.7K ohm	N-0247EEC	VRD-RA2EE472J
R627 ⚠	Metal Film, 0.47 ohm, 1W, ±5%	N-0018EGE	VRN-RV3AAR47J
R628 ⚠	Metal Film, 10 ohm, 1/2W, ±5%	N-0063EFE	VRS-SU2HC100J
R629 ⚠	1 ohm	N-0022EEC	VRD-RA2EE1R0J
R630	Oxide Film, 560 ohm, 1W, ±5%	N-0176EGD	VRS-PV3AB561J
R631	Oxide Film, 8.2K ohm, 1W, ±5%		VRS-PV3AB822J
R632	15K ohm	N-0297EEC	VRD-RA2EE153J
R633	47K ohm	N-0340EEC	VRD-RA2EE473J
R634	22K ohm	N-0311EEC	VRD-RA2EE223J
R701 ⚠	Cement, 1.8 ohm, 5W, ±10%	N-0029FKF	VRW-KV3HC1R8K
R702	100K ohm	N-0371EEC	VRD-RA2EE104J
R703 ▲⚠	33K ohm	N-0324EEC	VRD-RA2EE333J
R704 ⚠	Metal Film, 150 ohm, 1/2W, ±5%		VRS-SU2HC151J
R705 ⚠	Metal Film, 330 ohm, 3W, ±5%	N-0159EJE	VRS-VV3LB331J
R706 ▲⚠	56K ohm	N-0345EEC	VRD-RA2EE563J
R707 ▲⚠	*See* Controls		
R708 ▲⚠	820K ohm	N-0440EEC	VRD-RA2EE824J
R709 ▲⚠	2.7K ohm	N-0224EEC	VRD-RA2EE272J
R710	15K ohm	N-0297EEC	VRD-RA2EE153J

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R711	560 ohm	N-0176EEC	VRD-RA2EE561J
R712	56 ohm		VRD-RA2EE560J
R713	18K ohm	N-0303EEC	VRD-RA2EE183J
TRANSFORMERS			
T601	Horizontal Driver	ATB-0495	RTRNZ0059CEZZ
T602 ▲⚠	(Fly back) Horizontal Output	ATD-0004	RTRNF1344CEZZ
T603 ▲⚠	Side Pin	ATB-0496	RTRNQ0044CEZZ
T702	Power Choke	ATA-1062	RTRNC0028CEZZ
CONTROLS			
R419	Pot, Sub-Brightness, B-curve 20K ohm	AP-7412	RVR-M7059TAZZ
R420	Pot, Brightness, B-curve 10K ohm	AP-7413	RVR-B4638CEZZ
R422	Pot, Contrast B-curve 100 ohm	AP-7414	RVR-B7124TAZZ
R469	Pot, Brown ADJ, B-Curve 5K ohm		RVR-M7198TAZZ
R507	Pot, V-Size, B-curve 100 ohm	AP-7414	RVR-B7124TAZZ
R514	Pot, V-Hold, B-curve 5K ohm	AP-7415	RVR-B4637CEZZ
R526	Pot, V-Line, B-curve 500 ohm	AP-7416	RVR-M7015TAZZ
R607	Pot, H-Hold, B-curve 5K ohm	AP-7419	RVR-M7119TAZZ
R619	Pot, H-Center, B-curve 50K ohm	AP-7417	RVR-B4641CEZZ
R707 ▲⚠	Pot, B+ ADJ, B-curve 1K ohm	AP-7418	RVR-M7046TAZZ
MISCELLANEOUS			
PR701 ⚠	Thermistor	ARX-0417	RMPTP0030CEZZ
	Holder, Fuse	F-1406	QFSHD1002CEZZ

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	P.C.B. Assembly, CRT Socket (PCB-B)	AX-9497	DUNTK1205RA0H
	Consists of the following: (U.S.A.)		
	P.C.B. Assembly, CRT Socket (PCB-B)		DUNTK1205RA2H
	Consists of the following: (CANADA)		
CAPACITORS			
C850	Ceramic, 150pF, 50V, ±10%	CC-151KJCA	VCKYAT1HB151K
C851	Ceramic, 150pF, 50V, ±10%	CC-151KJCA	VCKYAT1HB151K
C852	Ceramic, 150pF, 50V, ±10%	CC-151KJCA	VCKYAT1HB151K
C853	Electrolytic, 22μF, 250V, +50−10%	CC-226WRAP	VCEAAH2EW226Y
C854	Ceramic, 0.01μF, 1.4KV, ±20%	CC-103MYCP	RC-KZ007JCEZZ
C855	Ceramic, 270pF, 50V, ±10%	CC-271KJCA	VCKYAT1HB271K
C856	Ceramic, 180pF, 50V, ±10%		VCKYAT1HB181K
C857	Ceramic, 220pF, 50V, ±10%	CC-221KJCA	VCKYAT1HB221K

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
CONNECTORS			
	(Socket) CRT Socket, 8 pin	AJ-7615	QSOCV1425CEZZ
	(Socket) for Main PCB 6 pin (U.S.A.)		CSOCN0630RA2C
	(Socket) for Main PCB 6 pin (CANADA)		CSOCN0630RA3C
TRANSISTORS			
Q851	2SC2068 (LB) Silicon, red output, NPN	2SC-2068LB	VS2SC2068LB1E
Q852	2SC2068 (LB) Silicon, green output, NPN	2SC-2068LB	VS2SC2068LB1E
Q853	2SC2068 (LB) Silicon, blue output, NPN	2SC-2068LB	VS2SC2068LB1E
RESISTORS: Unless otherwise specified resistors are 1/4W, ±5%, Carbon type.			
R850	47 ohm	N-0099EEC	VRD-RA2EE470J
R851	47 ohm	N-0099EEC	VRD-RA2EE470J
R852	47 ohm	N-0099EEC	VRD-RA2EE470J
R853	150 ohm	N-0142EEC	VRD-RA2EE151J
R854	270 ohm	N-0155EEC	VRD-RA2EE271J
R855	150 ohm	N-0142EEC	VRD-RA2EE151J
R856	*See* Controls		
R857	150 ohm	N-0142EEC	VRD-RA2EE151J
R858	*See* Controls		
R860	820 ohm	N-0187EEC	VRD-RA2EE821J
R861	820 ohm	N-0187EEC	VRD-RA2EE821J
R862	820 ohm	N-0187EEC	VRD-RA2EE821J
R863	*See* Controls		
R864	*See* Controls		
R865	*See* Controls		
R866 ⚠	Oxide Film, 5.6K ohm, 2W, ±5%	N-0257EHD	VRS-PU3DB562J
R867 ⚠	Oxide Film, 5.6K ohm, 2W, ±5%	N-0257EHD	VRS-PU3DB562J
R868 ⚠	Oxide Film, 5.6K ohm, 2W, ±5%	N-0257EHD	VRS-PU3DB562J
R869	220K ohm	N-0396EEC	VRD-RA2EE224J
R880	Solid, 2.7K ohm, 1/2W, ±10%	N-0224FFB	VRC-MA2HG272K
R881	Solid, 2.7K ohm, 1/2W, ±10%	N-0224FFB	VRC-MA2HG272K
R882	Solid, 2.7K ohm, 1/2W, ±10%	N-0224FFB	VRC-MA2HG272K
R883	Solid, 470K ohm, 1/2W, ±10%	N-0423FFB	VRC-MA2HG474K
CONTROLS			
R856	Pot, Red Drive, B-curve 500 ohm	AP-7420	RVR-B4224CEZZ
R858	Pot, Blue Drive, B-curve 500 ohm	AP-7420	RVR-B4224CEZZ
R863	Pot, Red Bias, B-curve 5K ohm	AP-7421	RVR-B4225CEZZ
R864	Pot, Green Bias, B-curve 5K ohm	AP-7421	RVR-B4225CEZZ
R865	Pot, Blue Bias, B-curve 5K ohm	AP-7421	RVR-B4225CEZZ

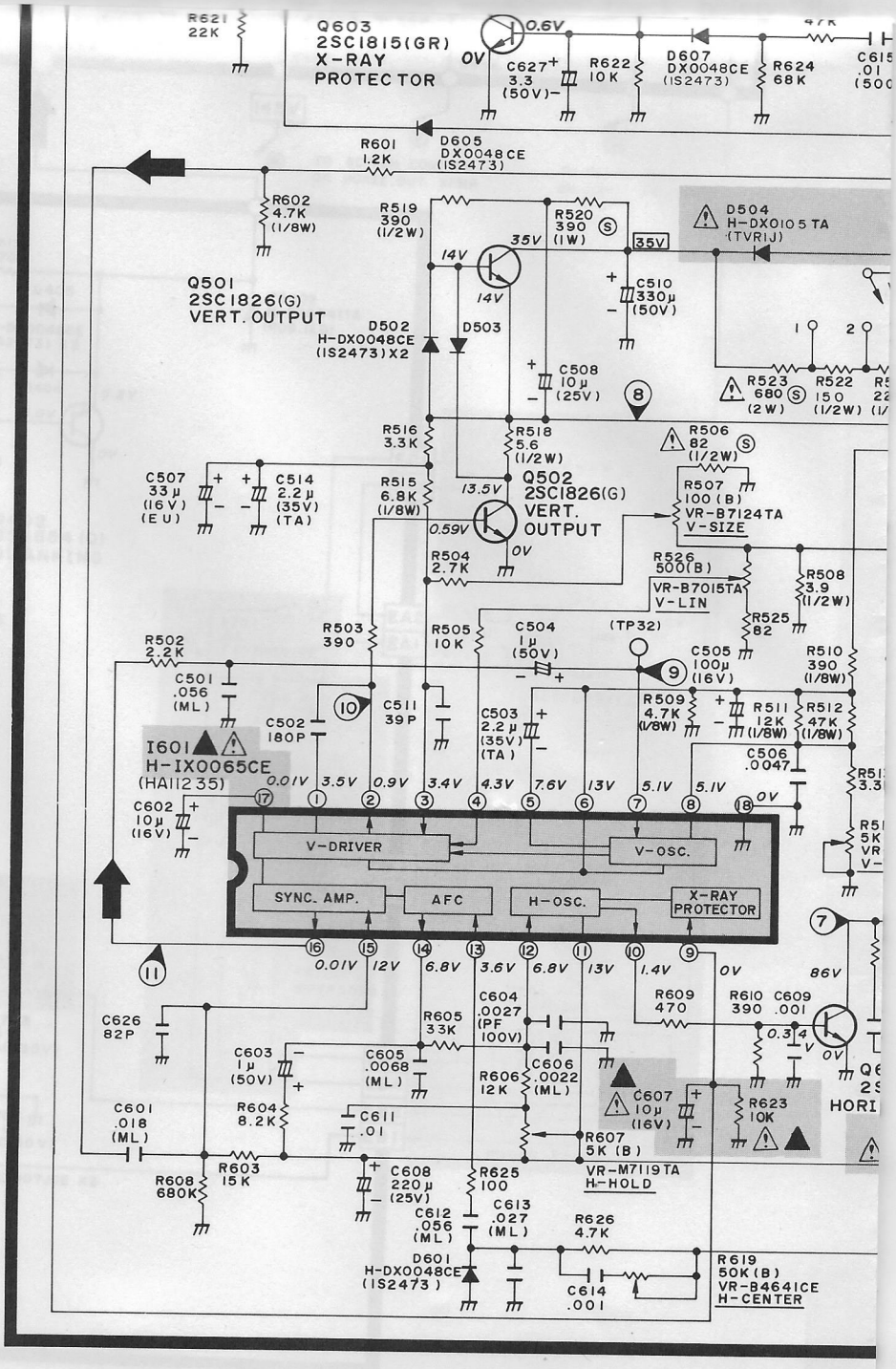
REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
MISCELLANEOUS			
SG850⚠	Spark Gap	C-1488	QSPGC0010CEZZ
SG851⚠	Spark Gap	C-1488	QSPGC0010CEZZ
SG852⚠	Spark Gap	C-1488	QSPGC0010CEZZ
SG853⚠	Spark Gap	C-1489	QSPGC0011CEZZ
SG854⚠	Spark Gap	C-1563	QSPGH0013CEZZ

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	P.C.B. Assembly, LED (PCB-C) **Consists of the following:**	AX-9498	DUNTK1206RA0H
CONNECTOR			
A	Socket for Main PCB 2 pin	AJ-7616	CSOCN0210RA9Y
DIODE			
D708	LN217RP LED	AX-2455	RH-PX0034CEZZ
RESISTOR			
R752	Carbon, 1.8K ohm, 1/4W, ±5%	N-0210EEC	VRD-RA2EE182J
MISCELLANEOUS (Parts not located on the PCBs)			
	Socket from Power Switch	AJ-7617	CSOCN0403RA16
SW701⚠	Switch, Power	AS-2909	QSW-P0081TAZZ
	Cord, AC	AW-3260	QACCD0020TAZZ
T701	Transformer, Power	ATA-1061	RTRNP0325TAZZ
L701	Coil, Automatic Degaussing	ACA-8375	RCILG0216CEZZ
	Tube, Picture (with Deflection Yoke)	AXX-8403	VBE2908TC121E
DY601	Yoke Deflection	ATB-0502	RCILH1424CEZZ
	PVC Tube, Power Switch Lead Insulator		VT-UL0060T260
	PVC Tube, AC Cord Insulator		VT-UL0060T140
	Signal Input Cable Unit (U.S.A.)	AW-3261	QCNW-0440TAZZ
	Signal Input Cable Unit (CANADA)		QCNW-0448TAZZ

8.2 Cabinet Parts List

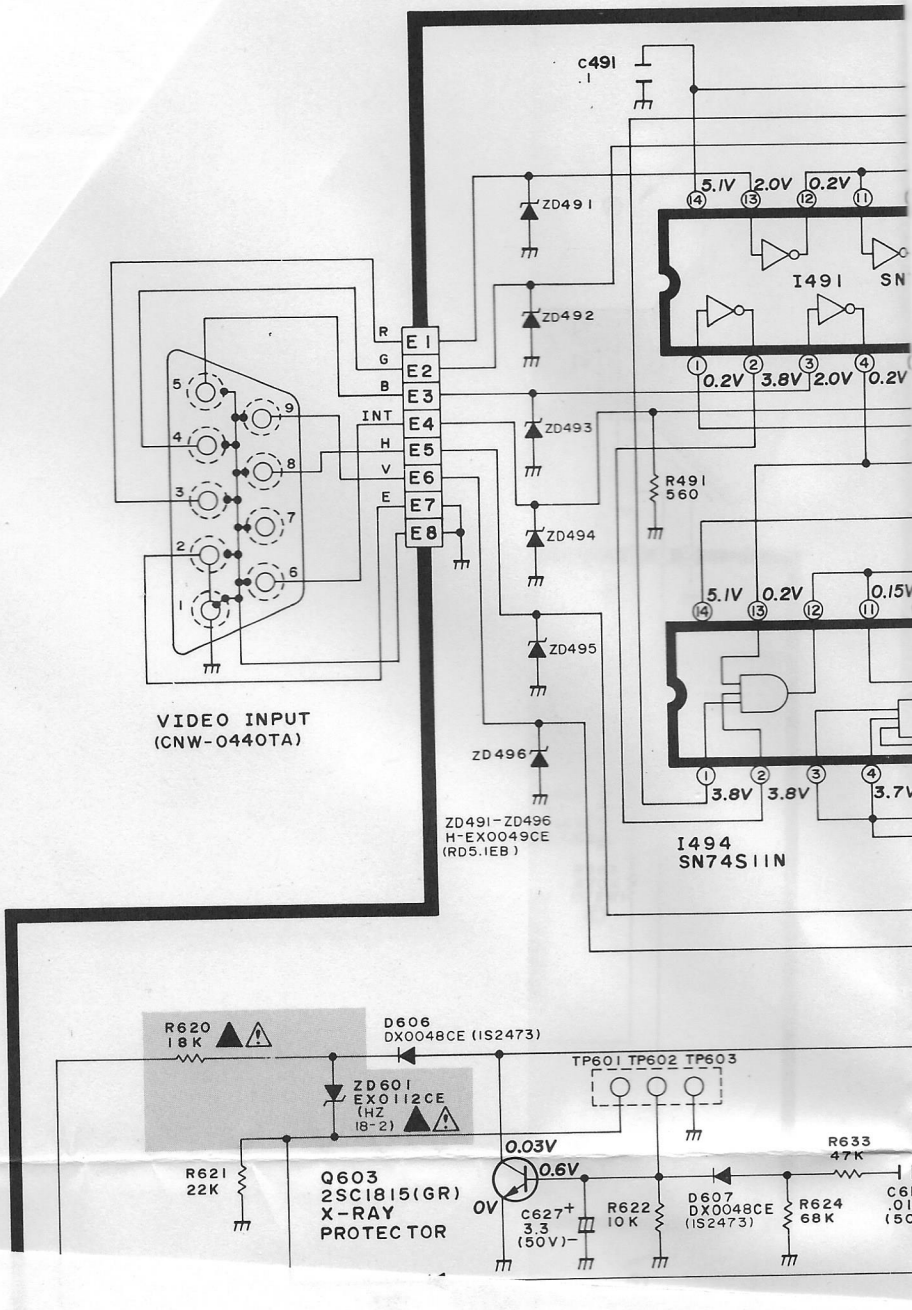
REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
101	Cabinet Ass'y, Front (Up to 10050 U.S.A.)	AZ-7160	DCABA7586TAK1
	(U.S.A. 10051~)		DCABA7586TAK2
101	(CANADA)		DCABA7744TAK1
101-1	Cabinet, Front		GCABA1388CEKC
101-2	Door, Control	AD-0467	GDORF1327CEKD
101-3	Plate, Front Decoration	AHC-3103	HDECA0512CESA
101-4	Plate, Control	AHC-3104	HINDM2387CESA
101-5	Button, Control	AK-5649	JBTN-1149CEKC
101-6	Spring, Button	ARB-7736	MSPRC0038CEZZ
101-7	Badge, TANDY (Up to 10050 U.S.A.)	AHC-3105	HBDGZ3057CESA
	(CANADA/U.S.A. 10051~)		HBDGZ3059CESA
101-8	Nut	AHD-7317	LX-NZ3014CEFN
101-9	Nut	AHD-7321	LX-NZ3073CEZZ
101-10	Label, Warning (CANADA)		TCAUS3052CEZZ
101-11	Label, Warning (CANADA)		TCAUS3055CEZZ
102	Cabinet Ass'y, Rear (U.S.A.)	AZ-7161	DCABB7586TAK1
	(CANADA)		DCABB7744TAK1
102-1	Cabinet, Rear		GCABB1444CEKD
102-2	Label, Model NO. (CANADA)		TLABM1132TAZZ
102-3	Label, X-Ray Caution		TCAUH0092TAZZ
102-4	Label, FCC Caution (U.S.A.)		TCAUS0452TAZZ
	Label, Caution (CANADA)		TLABM0459TAZZ
102-5	Label, Warning		TCAUS3062CEZZ
102-6	Nut		LX-NZ3073CEZZ
102-7	Shield		PSLDM3546CEFW
103	Bracket, Power Switch Fixing		LANGT9341CEZZ
104	Wire Holder, Black (Tighting)		LHLDW1033CE00
105	Screw, 3 x 5mm, Machine, Pan Head	AHD-2878	LX-BZ3086CEFD
106	Cover, AC Cord, AGL		GCOVH9160CE00
107	Bracket, Power Transformer Fixing		LANGR5046CEZZ
108	Holder, Black, AC Cord Stopper		LHLDK1019TA00
109	Wire Holder, White		LHLDW1007GEZZ
110	Wire Holder, White (U.S.A.)		LHLDW1037CEZZ
	Black (CANADA)		LHLDW1005GEZZ
111	Screw, 4 x 10mm, Tapping-2, Round Head	AHD-2917	LX-UZ3006CEFD
112	Knob, Control	AK-5650	JBNBK1149CEKA
113	Frame, Chassis		LCHSM0105CEZZ
114	Screw, 3 x 8mm, Tapping-2, Round Head	AHD-2918	LX-CZ3001CEFD
115	Screw, 3 x 12mm, Tapping-2, Round Head	AHD-2919	LX-CZ3002CEFD
116	Wire, Grounding Strap		EWBC-L410DE03
117	Screw, 5 x 40mm, Tapping-1, Pan Head	AHD-2920	LX-TZ3023CEFD
118	Spring, Grounding Strap, Fixing		MSPRT0020CEZZ
119	Spacer		PSPAG0003CE00
120	Screw, 3 x 8mm, Tapping-2, Round Head	AHD-2883	XCASD30P08000
121	Not Used		———
122	Screw, 3 x 10mm, Tapping-2, Round Head		XUASD30P10000

REF.NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
123	Not Used		———
124	Screw, 4 x 8mm, Machine, Pan Head	AHD-2922	XBPBW40P08000
125	Washer, ϕ4mm	AHD-8882	XWSSJ40-10000
126	Screw, 4 x 8mm, Tapping-2, Round Head	AHD-2923	XCASD40P08000
Hardware Kit		AHW-2603212	DBNW-7586RA01
	127 Screw, 4 x 20mm, Tapping-2, Trass Head		XUTSD40P20000
	128 Screw, 4 x 12mm, Tapping-2, Round Head		XCASD40P12000
129	Not Used		———
130	Wire Holder, White Round Type		LHLDW1046CEZZ
131	Screw, 3 x 10mm, Machine, Pan Head	AHD-2924	LX-BZ3049GEFD
132	Screw, 3 x 8mm, Machine, Pan Head	AHD-2915	LX-BZ3100CEFD
133	Screw, 3 x 8mm, Tapping-2, Round Head	AHD-2883	XCASD30P08000
134	Screw, 3 x 12mm, Tapping-2, Round Head	AHD-2914	XCASD30P12000
135	Heat Sink (Q501,Q502)		PRDAF0251TAFW
136	Heat Sink (Q501,Q502)		PRDAF0222TAFW
137	Heat Sink (Q602)		PRDAR1126CEFW
138	Heat Sink (Q602)		LANGT9159CEZZ
139	Heat Sink (SCR701)		PRDAR5043CEFW
140	Screw (for Switch-Angle)		XTASD40P12000
141	Ground Label		TCAUS0449TAZZ
142	Wire Holder,White Round Type (U.S.A.)		LHLDW1064CEZZ
	Black Round Type (CANADA)		LHLDW1080CEZZ
143	Angle (for Wire Holder)		LANGK0262CEFW
144	Label, Manufactured & Serial NO. (U.S.A.)		TLABN0085TAZZ
	(CANADA)		TLABN0086TAZZ
145	Heat Sink		PRDAF0217TAFW
146	Label, Fuse Caution (CANADA)		TCAUS0460TAZZ
147	Label, Fuse Caution (CANADA)		TCAUS3095CEZZ
148	Label, Model NO. (CANADA)		TLABN0042CEZZ
149	Label, Address (CANADA)		TLABZ0107CEZZ
150	Spacer		PSPAG0135CE00
151	Label, Model NO. (Up to 10050 U.S.A.)		TLABM1121TAZZ
	(U.S.A. 10051 ~)		TLABM1145TAZZ

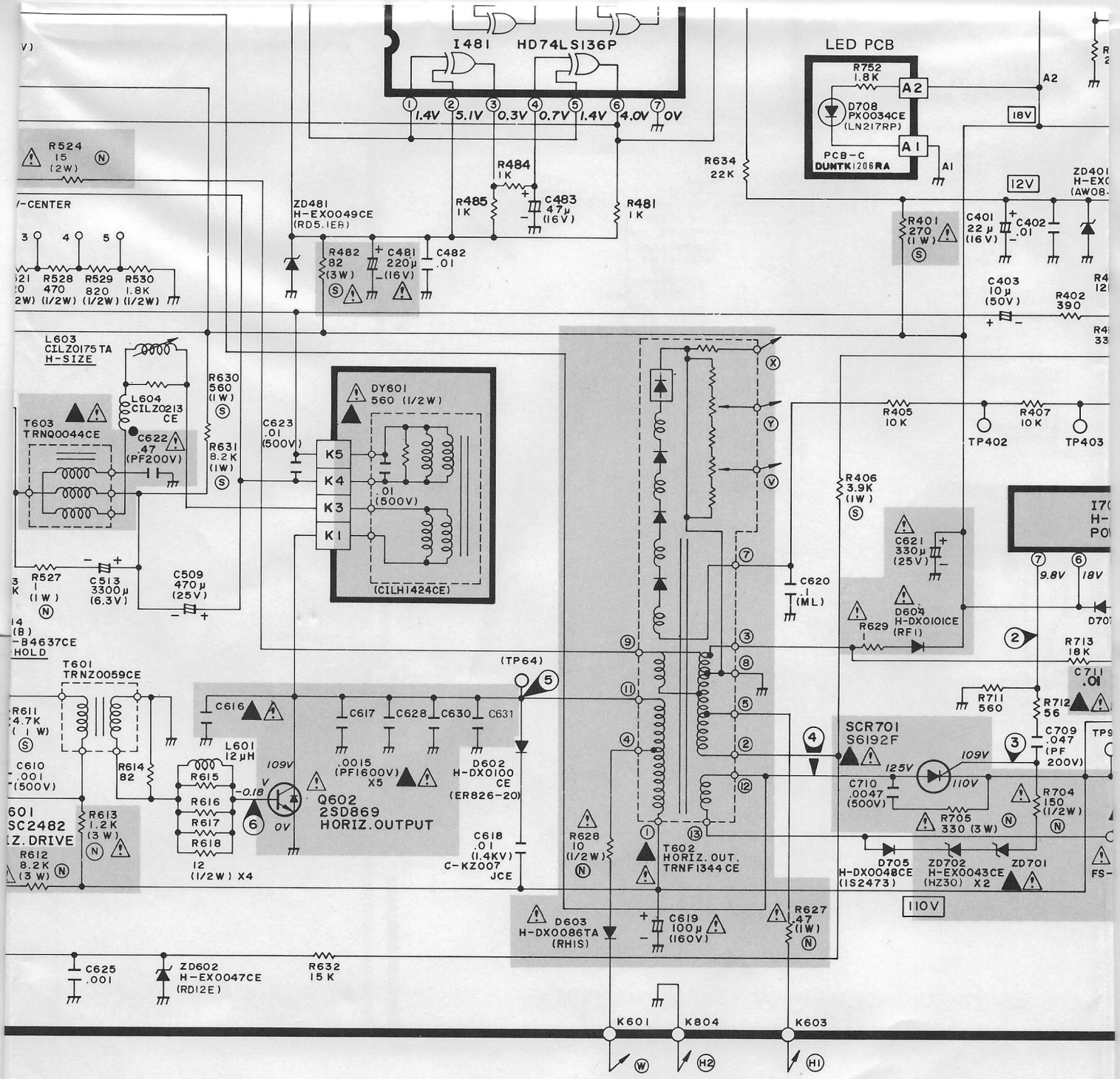


NOTES:

1. The unit of resistance "ohm" is omitt (K:1000 ohms, M:1 Meg ohm)
2. All resistors are 1/4 watt, unless otherw noted.
3. All capacitors are μF, unless otherwise not (P-μμF)
4. (G) indicates ±2% tolerance may be use


C491
.1
ZD491
ZD492
ZD493
ZD494
ZD495
ZD496
R491
560
5.1V
2.0V
0.2V
I491
SN
0.2V
3.8V
2.0V
0.2V
5.1V
0.2V
0.15V
3.8V
3.8V
3.7V
I494
SN74S11N
R
G
B
INT
H
V
E
E1
E2
E3
E4
E5
E6
E7
E8
VIDEO INPUT
(CNW-0440TA)
ZD491-ZD496
H-EX0049CE
(RD5.1EB)
R620
18K
D606
DX0048CE (1S2473)
TP601 TP602 TP603
ZD601
EX0112CE
(HZ
18-2)
R621
22K
Q603
2SC1815(GR)
X-RAY
PROTECTOR
0.03V
0.6V
0V
C627+
3.3
(50V)-
R622
10K
D607
DX0048CE
(1S2473)
R624
68K
R633
47K
C615
.01
(500

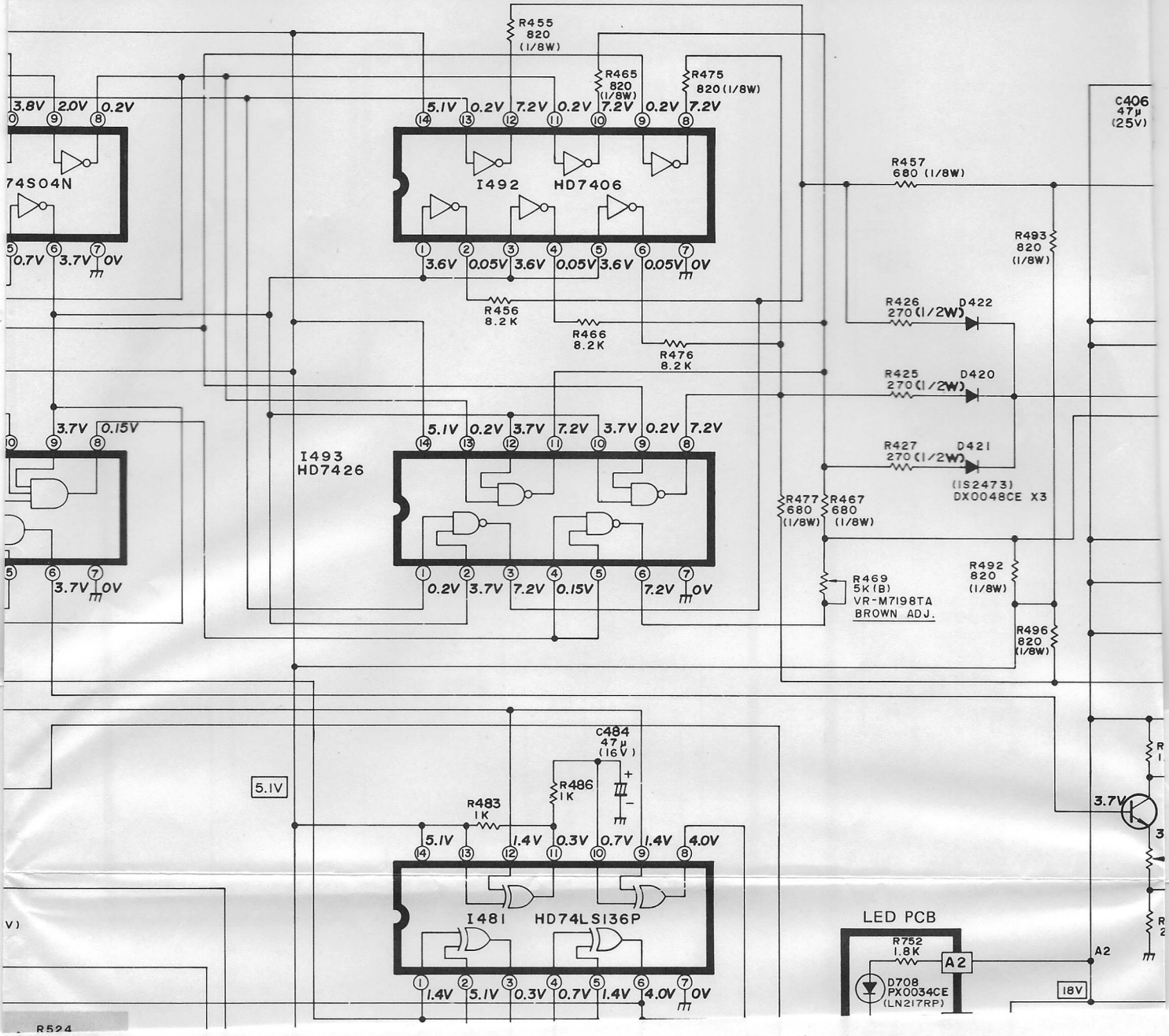
26-3212

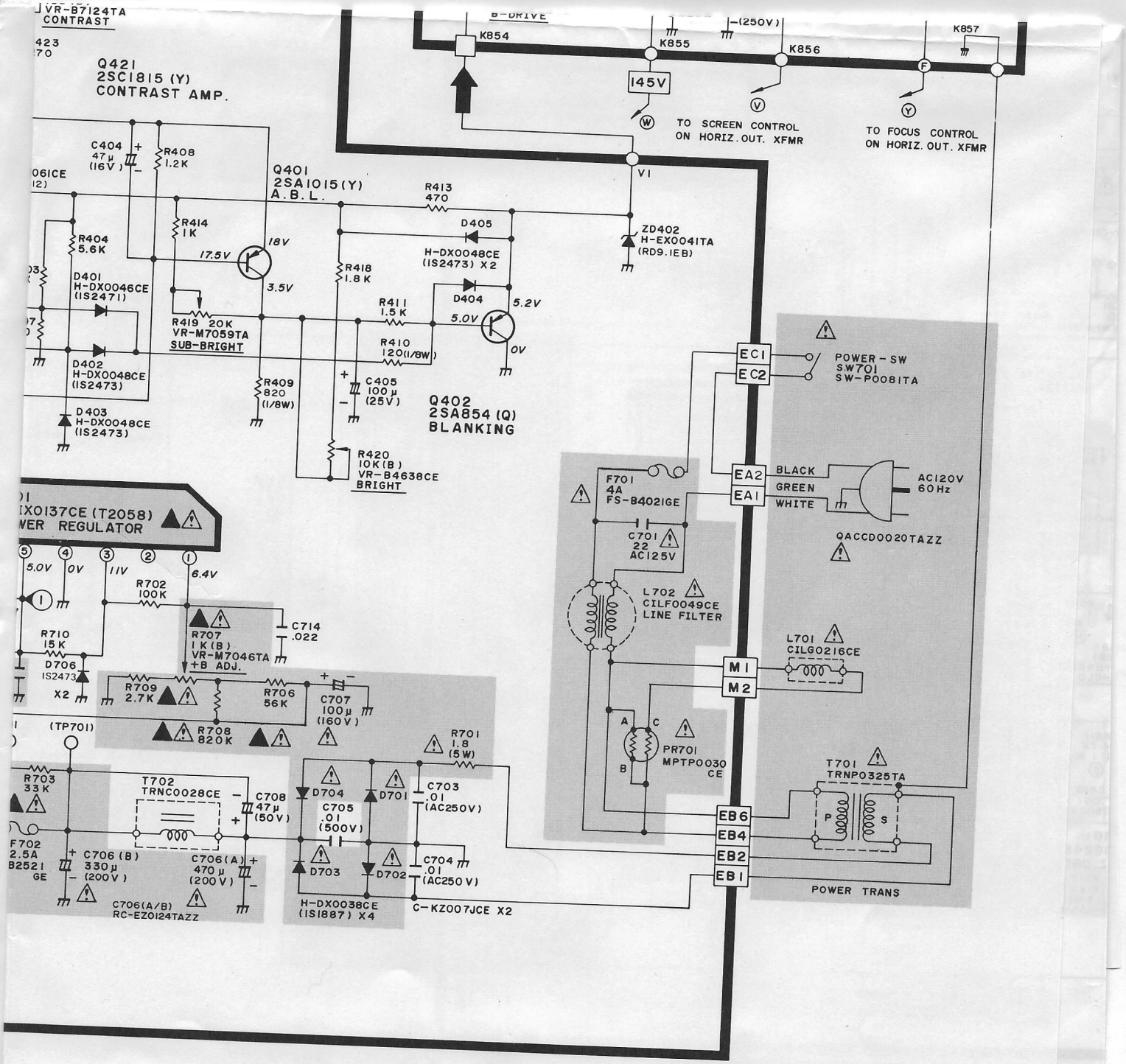


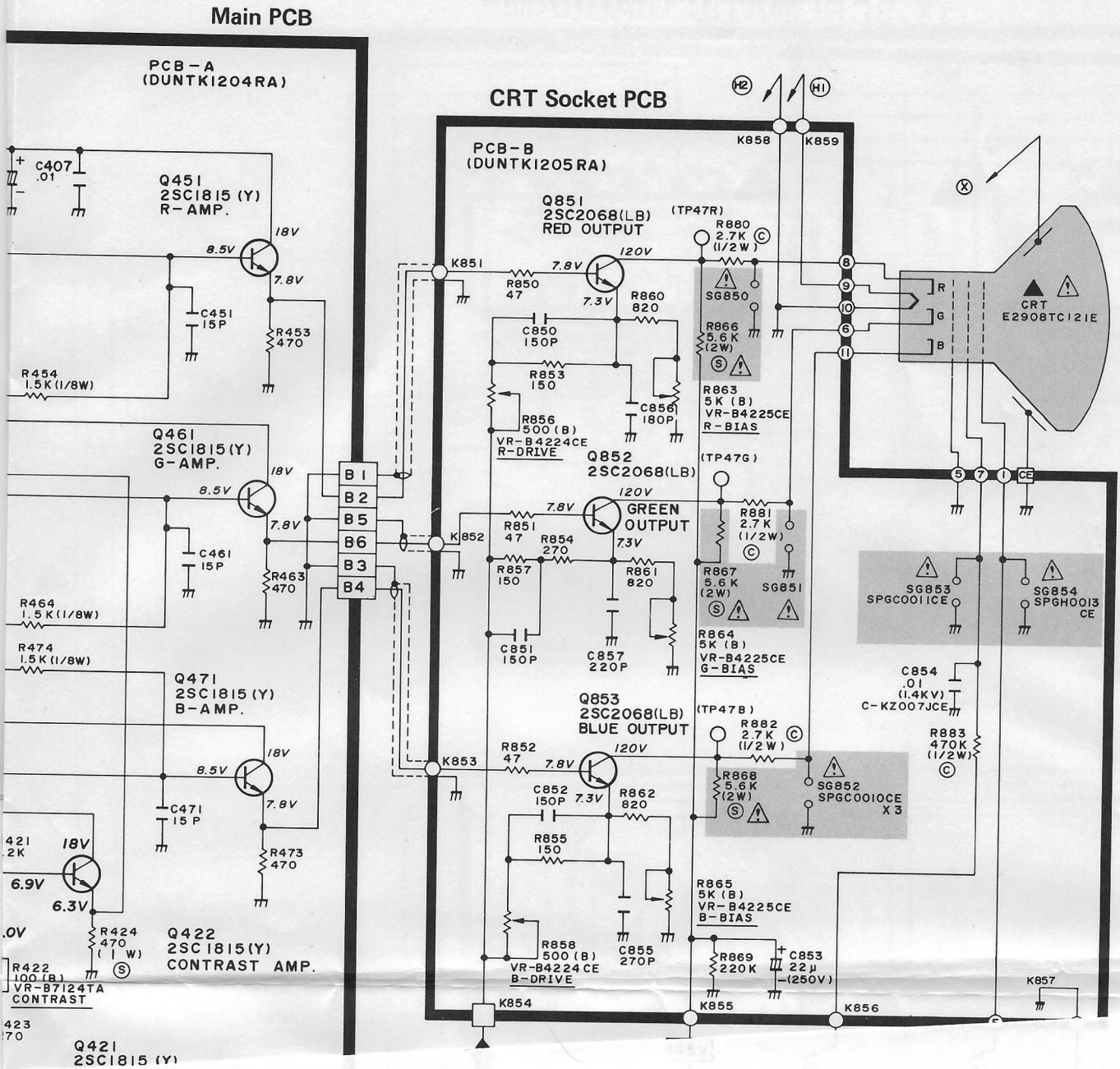
1. All DC voltages are measured with VTVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.
2. All voltage measured with 1000μV B & W or Color signal.

⚠ AND SHADED COMPONENTS: SAFETY RELATED PARTS, ▲ MARK: X-RAY RELATED PARTS.

IX. SCHEMATIC DIAGRAM




VR-B7124TA
CONTRAST
Q421
2SC1815 (Y)
CONTRAST AMP.
C404
47μ
(16V)
R408
1.2K
Q401
2SA1015(Y)
A.B.L.
R413
470
R414
1K
18V
17.5V
3.5V
R404
5.6K
D401
H-DX0046CE
(IS2471)
D405
H-DX0048CE
(IS2473) X2
ZD402
H-EX0041TA
(RD9.1EB)
R418
1.8K
D404
5.2V
5.0V
0V
R411
1.5K
R419 20K
VR-M7059TA
SUB-BRIGHT
R410
120(1/8W)
D402
H-DX0048CE
(IS2473)
R409
820
(1/8W)
C405
100μ
(25V)
D403
H-DX0048CE
(IS2473)
Q402
2SA854 (Q)
BLANKING
R420
10K(B)
VR-B4638CE
BRIGHT
B-DRIVE
K854
K855
K856
K857
(250V)
145V
TO SCREEN CONTROL
ON HORIZ. OUT. XFMR
TO FOCUS CONTROL
ON HORIZ. OUT. XFMR
V1
EC1
EC2
POWER-SW
SW701
SW-P0081TA
EA2
EA1
BLACK
GREEN
WHITE
AC120V
60Hz
QACCD0020TAZZ
F701
4A
FS-B4021GE
C701
22
AC125V
L702
CILF0049CE
LINE FILTER
L701
CILG0216CE
M1
M2
PR701
MPTP0030
CE
T701
TRNP0325TA
P
S
EB6
EB4
EB2
EB1
POWER TRANS
IX0137CE (T2058)
WER REGULATOR
5.0V
0V
11V
6.4V
R702
100K
R707
1K(B)
VR-M7046TA
+B ADJ.
C714
.022
R710
15K
D706
IS2473
X2
R709
2.7K
R706
56K
C707
100μ
(160V)
R708
820K
R701
1.8
(5W)
(TP701)
R703
33K
T702
TRNC0028CE
C708
47μ
(50V)
D704
C705
.01
(500V)
D701
C703
.01
(AC250V)
F702
2.5A
B2521
GE
C706(B)
330μ
(200V)
C706(A)
470μ
(200V)
C706(A/B)
RC-EZ0124TAZZ
D703
D702
C704
.01
(AC250V)
H-DX0038CE
(IS1887) X4
C-KZ007JCE X2

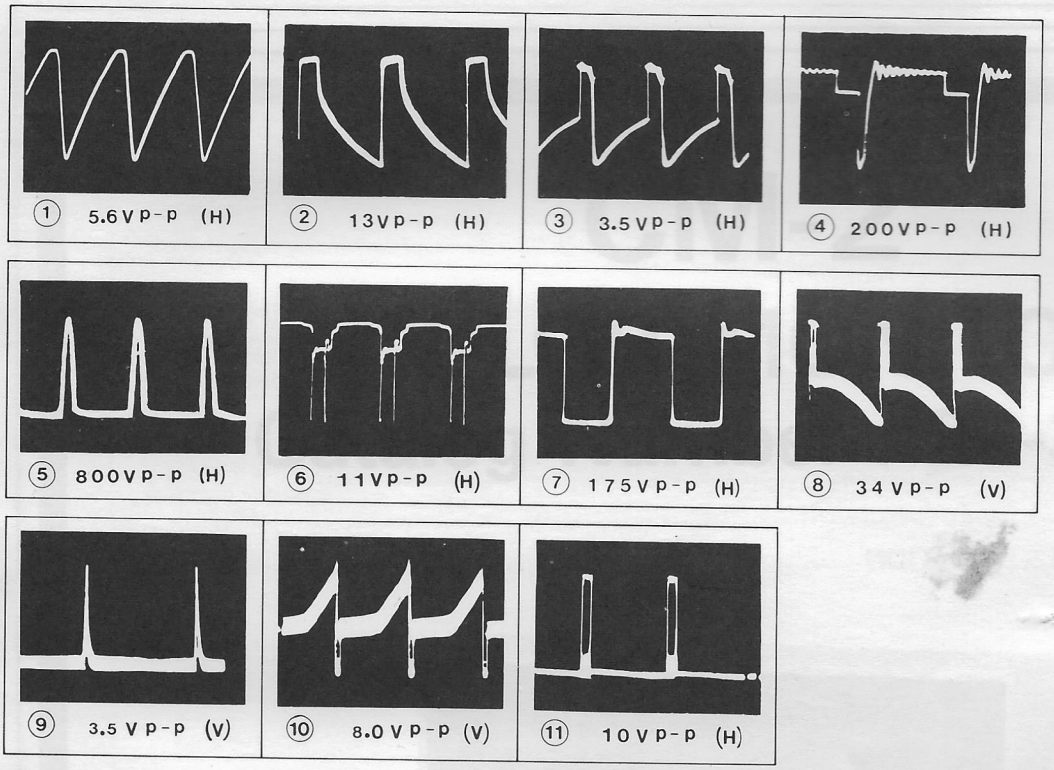

Main PCB
PCB-A
(DUNTK1204RA)
CRT Socket PCB
PCB-B
(DUNTK1205RA)
C407
.01
Q451
2SC1815 (Y)
R-AMP.
18V
8.5V
7.8V
C451
15P
R453
470
R454
1.5K(1/8W)
Q461
2SC1815(Y)
G-AMP.
C461
15P
R463
470
R464
1.5K(1/8W)
R474
1.5K(1/8W)
Q471
2SC1815 (Y)
B-AMP.
C471
15 P
R473
470
6.9V
6.3V
R424
470
(1 W)
R422
100 (B)
VR-B7124TA
CONTRAST
Q422
2SC1815(Y)
CONTRAST AMP.
Q421
2SC1815 (Y)
B1
B2
B5
B6
B3
B4
K851
K852
K853
K854
K855
K856
K857
K858
K859
H2
H1
X
Q851
2SC2068(LB)
RED OUTPUT
(TP47R)
R880
2.7K
(1/2W)
R850
47
7.8V
120V
7.3V
R860
820
C850
150P
R853
150
R856
500 (B)
VR-B4224CE
R-DRIVE
C856
180P
R866
5.6K
(2W)
SG850
R863
5K (B)
VR-B4225CE
R-BIAS
Q852
2SC2068(LB)
GREEN
OUTPUT
(TP47G)
R851
47
R854
270
R857
150
R861
820
C851
150P
C857
220P
R881
2.7K
(1/2W)
R867
5.6K
(2W)
SG851
R864
5K (B)
VR-B4225CE
G-BIAS
Q853
2SC2068(LB)
BLUE OUTPUT
(TP47B)
R882
2.7K
(1/2W)
R852
47
C852
150P
R862
820
R855
150
R858
500 (B)
VR-B4224CE
B-DRIVE
C855
270P
R868
5.6K
(2W)
SG852
SPGC0010CE
X3
R865
5K (B)
VR-B4225CE
B-BIAS
R869
220K
C853
22μ
(250V)
CRT
E2908TC121E
R
G
B
8
9
10
6
11
5
7
1
CE
SG853
SPGC0011CE
SG854
SPGH0013
CE
C854
.01
(1.4KV)
C-KZ007JCE
R883
470K
(1/2W)

X. WAVEFORMS

WAVEFORM MEASUREMENT CONDITIONS:

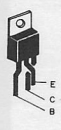
1. The voltage level and waveform at each point are given below on 120V/AC power, when this set is connected to a personal computer with video signal input at 0-volt (namely, with the screen having no brightness).

2. ◯► indicates waveform check points (See chart, waveform are measured from point indicated to chassis ground.)



XI. SEMICONDUCTOR LEAD IDENTIFICATION

Q501
Q502

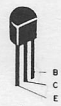


2SC1826
(G)

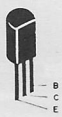
Q851
Q852
Q853

2SC2068
(LB)

Q401 Q451
Q402 Q461
Q421 Q471
Q422 Q603



Q601



2SC2482

Q401	2SA1015(Y)
Q402	2SA854(Q)
Q421	2SC1815(Y)
422	
451	
461	
471	
Q603	2SC1815(GR)

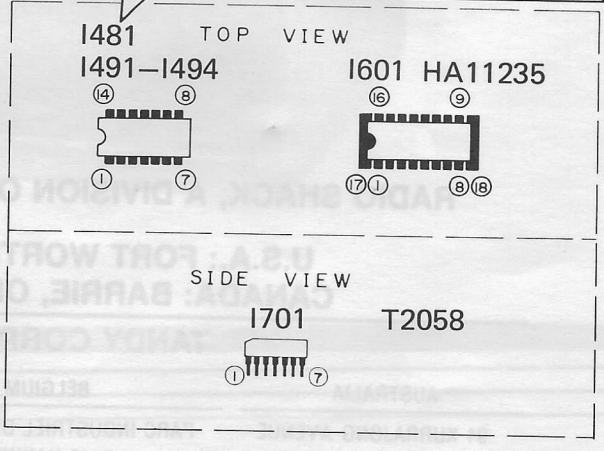
SCR701

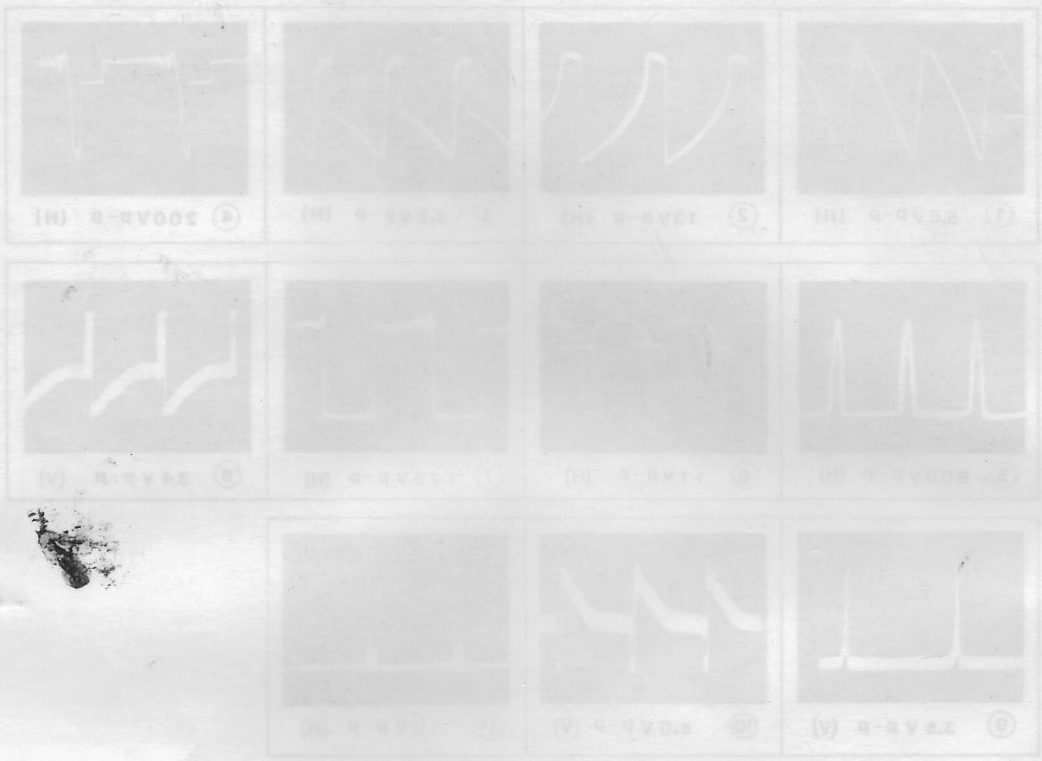
S6192F

Q602

2SD869

- I481 HD74LS136P
- I491 SN74S04N
- I492 HD7406P
- I493 HD7426P
- I494 SN74S11N





RADIO SHACK, A DIVISION OF TANDY CORPORATION

U.S.A.: FORT WORTH, TEXAS 76102
CANADA: BARRIE, ONTARIO L4M 4W5

TANDY CORPORATION

AUSTRALIA	BELGIUM	U. K.
91 KURRAJONG AVENUE MOUNT DRUITT, N.S.W. 2770	PARC INDUSTRIEL DE NANINNE 5140 NANINNE	BILSTON ROAD WEDNESBURY WEST MIDLANDS WS10 7JN

9A4

Printed in Japan